REMARKS

Applicant amended the claims to correct a typographical error in the patent as filed, and to further clarify the scope of the claimed invention. All revised wording is supported by the specification as originally filed; no new material has been added to the claims that are not disclosed in the specification. The Office Action dated April 3, 2003 has been carefully studied. For the reasons set forth below, Applicant believes the claims as amended are patentable over the prior art cited.

Rejections Under 35 U.S.C. § 103(a)

The Examiner has rejected claims 1-3 under 35 U.S.C. §103(a) as being unpatentable over the website www.howstuffworks.com, in view of Intellectual Property Technology Exchange (IPTEX), further in view of R. Mansini, Selection of Lease Contracts in an Asset-Back Securitization, further in view of US patent 5,704,044 and US patent 6,018,714. Applicant respectfully traverses this rejection and believes the amended claims of the present invention are clearly distinguishable from and patentable over the cited references that are actually prior art to the present application, as explained below.

First, Applicant would respectfully point out to the Examiner that while the website www.howstuffworks.com predates the present invention, the specific Question of the Day "How Does Venture Capital Work" cited by the Examiner, does not appear to predate the present invention. The application for the present invention claims priority to Provisional patent application 60/115490 filed on January 11, 1999. Therefore, any document dated later than January 11, 1999, would not be prior art to this application. An examination of the website www.web.archive.org shows archived versions of the website www.howstuffworks.com dating back to December 5, 1998, as; shown in Exhibit 1, attached hereto1. The December 12, 1998 version of the website www.howstuffworks.com is the latest archived image that predates

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1 Please note that since all relevant dates appear on first page of this website, pages 2-8 were not included in this Exhibit for purposes of efficiency.

January 11, 1999. A search of the December 12, 1998 version of the howstuffworks question archive as of that date, a copy of which is attached hereto as Exhibit 2, does not reveal the question "How Does Venture Capital Work" in the archived list of Questions of the Day. The earliest archived version of the howstuffworks website that does contain the specific question "How Does Venture Capital Work" is dated May 19, 2000, more than one year after the filing date of the provisional patent application, and approximately 4 months after the date of filing the utility patent application hereto. A copy of the list of monetary-related questions from the May 19, 2000 archived howstuffworks website is attached hereto as Exhibit 3, and shows the question "How does Venture Capital Work?" as the third question in the list. Applicant respectfully submits that as of the time of filing the present application, the cited article was not published, and therefore is not prior art to the present invention.

Similarly, Applicant would respectfully point out to the Examiner that the website www.iptex.com, which describes the Intellectual Property Technology Exchange, a copy of which was provided by the Examiner, is dated April 19, 1999, which also post-dates the date of filing the provisional which lead to the present application. A copy of the reference is attached hereto as Exhibit 4. A search of the website www.web.archive.org, reveals no archived versions of the website www.iptex.com, which is also not currently an active website. A copy of the search results from the web archive and a current search are attached hereto as Exhibit 5. There is nothing to indicate any date for this disclosure earlier than April 19, 1999. Therefore, lacking any evidence to the contrary to indicate any date earlier than April 19, 1999, it must be presumed that April 19, 1999 is the first date of publication. The application for the present invention claims priority to Provisional patent application 60/115490 filed on January 11, 1999. Therefore, Applicant would respectfully submit that as of the time of the present application, the cited website www.iptex.com was not published, and therefore is not prior art.

Likewise, the Applicant would respectfully point out that the document R.Mansini, MG. Speranza, "Selection of Lease Contracts in an Asset-backed Securitization" is an abstract posted on the school website that indicates the article is scheduled "to appear" in the journal "Control and Cybernetics." The website provided by the Examiner is dated 3/12/02, which post-dates

both the January 11, 1999 filing date of the provisional application 60/115490 and the January 11, 2000 filing date of the present invention. Although the Examiner cites to this information being provided at a workshop on Decision Theory and Decision Support held in Laxenburg, Austria in 1998, a review of the Agenda for this workshop, a copy of which is attached hereto as Exhibit 6, does not reveal any presentation by these authors was made at this workshop. Similarly, a search of the website for the International Institute for Applied Systems Analysis, host of the 1998 workshop in Laxenburg does not reveal any documents for Mansini and Speranza. A copy of the website home page and the search performed are attached hereto as Exhibit 7. Similarly, accessing the website for the journal "Control and Cybernetics," in which the proposed article was to be published, a copy of which is attached hereto as Exhibit 8, does not provide any access that would enable a person to determine when, if at all, the article, or any article, was actually published. Applicant sent a request for information about the article to the magazine, and received a reply stating that the volume of the magazine containing the article was published 1999. A copy of the email correspondence is attached hereto as Exhibit 9. There is nothing to indicate any date for this disclosure earlier than January 11, 1999, the date provisional patent application 60/115490 filed. Indeed, the probability that the article was published in the first 10 days of the year 1999, rather than the remaining 355 days is very small. A search of the internet for information about the authors Speranza and Mansini, revealed various articles by the authors, but did not reveal a copy of the actual article or any mention of it other than the document cited by the Examiner. A copy of the search results is attached hereto as Exhibit 10. Indeed, the only website found that makes mention of the proposed article is the site for the University of Brescia that includes the abstract provided by the Examiner describing the "to be published" article. A copy of the home page for that website is attached hereto as Exhibit 11. However, it is impossible to determine from the University of Brescia web page when the abstract was actually published. Therefore, Applicant respectfully submits that there is nothing to indicate that the article by Mansini and Speranza, was published prior to January 11, 1999, the date of filing of the provisional application to which priority is claimed. Therefore, Applicant would respectfully submit that without any information available to determine the date of this document, it cannot be considered to be prior art to the present invention.

Additionally, Applicant would respectfully point out to the Examiner that the document "Valuation of Intellectual Property Assets" by Zareer Pavri of Price Waterhouse Coopers, which was cited by the Examiner as prior art in the last Office Action was first presented April 29-30, 1999. Because this presentation was made more than 3 months after the January 11, 1999 filing date of the provisional patent application from which this application claims priority, Applicant would respectfully submit that this document is not prior art to the present application.

Applicant would respectfully submit that of the prior art cited by the Examiner in this Office Action, only US Patent 5,704,044 to Tarter, US Patent 6,018,714 to Risen ("Risen"), and "Valuation of Intellectual Property and Intangible Assets" by Smith and Parr are actually prior art to the present invention, and should therefore be considered as a basis for rejection of the claims of the present invention under 35 U.S.C. § 103. As discussed below, Applicant can differentiate itself from this actual prior art.

Intellectual properties, such as patents, are considered intangible assets. This means that they are not real or concrete, like real estate, or do not have real or concrete products that help determine the value of an asset, such as with stocks, where the assets of a company form part of the basis of value for a stock. Real, concrete items can be more easily given a value, because they can be easily sold, and valued by comparison with similar other concrete items. Patents, on the other hand, being embodiments of ideas, are intangible. They cannot be touched, and have no physical product associated with the patent. Additionally, each patent is, by its nature, unique, and therefore a value cannot be easily determined by comparing a patent with other patents. Applicant can differentiate itself from the prior art by showing that it provides a method for valuating intellectual property, which is an **intangible** asset, which thereby makes it justifiable to warrant investing in intellectual properties by investors or groups of investors. The valuation and assessment of intangible assets is, and has traditionally been, difficult. Because it has been difficult to assign a value to intellectual property, investors are understandably reluctant to invest in intellectual property, or consider it an extremely high-risk venture. When determining the value of tangible assets, such as real estate, a value can be determined for the property based on the value of similar properties in the surrounding area, using valuation formulas that have been

developed, but which could not be used for determining a value for intellectual properties. While stock is an intangible asset, it has a tangible product, the assets of a company, including capital assets and accounts receivable, which serve as a basis for determining the value of stock, along with the market value for a stock. However, intellectual property is an intangible asset which has no tangible assets as a basis, but only the ideas and concepts disclosed therein. Nor can a patent be easily compared to similar products to determine a value, because each patent is unique, and the value is based not just on the invention disclosed, but the interest of potential users of the product, the potential market for the invention, duration of market for the invention, and the quality of the claims of the patent. These things made valuation of intellectual property difficult, as evidenced in documents of the time, as discussed in the following paragraph. The present patent provides a method of reliably assessing intellectual properties and assigning a value thereto. Because the value can be more accurately determined, intellectual property is more readily available to serve as a basis for investment by venture capitalists.

As evidence of the fact that valuation of intellectual property was considered difficult at the time of the present invention, Applicant would call to the Examiner's attention the document "Valuation of Intellectual Property Assets" by Zareer Pavri of Price Waterhouse Coopers, which was cited by the Examiner as prior art in the last Office Action. As discussed above, this document is not prior art to the present application, but it provides an indication of the state of the art at around the time of the filing of the patent application. It states that the "whole area of IP valuation is relatively new and continually evolving. Consequently, there is no general agreement ...as to an accepted valuation methodology." (see p. 8, lns 13-14). The paper goes on to discuss various valuation methods, including the standard cost, income and market value approaches to valuation, and describes the shortcomings in each of these methods when used to assess intellectual property. (see pp. 8-12, 14-17).

The present invention discloses and describes computerized methods of assessing the value of intellectual properties and assigning an appropriate purchase price to the intellectual properties in addition to using pooled funds to purchase the intellectual property. The present invention also typically anticipates the purchase of the intellectual property rights only for an

amount equal to or less than the valuation, but not more than the valuation amount (see p. 8, lns. 1-9). If the valuation does not indicate a value for an intellectual property or the assessed value is less than the current owner of the intellectual property rights is willing to accept in exchange for title to the rights, the investment typically will not take place.

The Examiner suggests that it would have been obvious to one of ordinary skill in the art to extend the process of US Patent 5,704,044 to Tarter ("Tarter"), to the evaluation of intellectual properties in light of US Patent 6,018,714 to Risen ("Risen"). Tarter is used specifically in the health care collectibles field, which is not in the same field as the present invention, and discloses an algorithm used to determine the purchase price for medical provider's accounts receivables (col 12., lns. 17-20). As discussed above, accounts receivables have a readily determined value; the algorithm of the Tarter patent is used to determine the estimated percentage that will be collected, and the actual value to a third party of those receivables. Although Tarter claims use of an algorithm to determine value of accounts receivables, nothing therein could be used for determining the value of intangible intellectual properties. Nor is there any disclosure of a pooling system for investing in one or more accounts receivable packages by more than one investor, let alone more than one intellectual property.

Risen talks about valuing an intellectual property, but states that assigning a monetary value to a patent can be difficult, and indicates that a preferred method of determining a value is to retain a firm that specializes in valuation of intellectual property. (col 11, lns. 11-13). A proposed alternative method proposed by Risen is to use an arbitrary valuation. (col. 11, lns. 24-27). Risen discloses and claims obtaining the valuation of the intellectual property from an outside expert, and putting that number into the algorithm of Risen used to determine insurance premiums. Risen does not disclose or suggest a method for using an algorithm to determine the value of an intellectual property. Indeed, it implies that such a value is difficult to determine, and should be done by an expert. It is because of the difficulty of determining an accurate value for an intellectual property that Risen provides insurance against a change in predicted value of the intellectual property. If an accurate method for determining the value of an intellectual property existed, there would not be as great a need for insurance against change in the predicted value.

Therefore, Risen actually teaches away from the invention of the present application by compensating for the lack of an accurate method of assessment by providing insurance to protect against inaccuracies in predicting the value of a patent.

The Examiner cites the book "Valuation of Intellectual Property and Intangible Assets" by Smith and Parr in the Office Action as prior art of record which should be considered when responding to this Office Action. Because only 3 random pages from the actual text of the book have been provided by the Examiner, Applicant cannot cite to specific differences between the present invention and this document. However, Applicant would respectfully call Examiner's attention to the document "Valuation of Intellectual Property Assets" by Zareer Pavri of Price Waterhouse Coopers which was cited by the Examiner in the most recent Office Action. This article, which is not prior art to the present invention, references the Smith and Parr book in the reference section of his presentation. In his presentation, Mr. Pavri describes two methods used to value intangibles described in valuation text books. Mr. Pavri then states that both of those methods are questionable when applied to valuing an identifiable intangible asset. (See Pavri, p. 14, lns. 12-14). Because the Smith and Parr book is the only valuation text book cited by Mr. Pavri in his list of references, it is assumed it is this book he is making reference to. As indicated in Risen, methods existed at the time for calculating the value of intangible intellectual properties; however, such calculations were difficult and best left to professionals. (See Risen, col. 11, lns 9-14). The present invention provides a computerized algorithm for performing such calculations, thereby simplifying the determination, and providing a more consistent result because there is less need for "guestimating" on the part of persons performing such valuation.

The Examiner states that that use of a computerized algorithm to assess the value of intellectual properties is disclosed in howstuffworks.com, and that such computerized methods are not patentable. Applicant would respectfully submit that, as shown above, howstuffworks.com is not prior art to the present invention. Even if it were shown to be prior art, nothing in the article mentions computers, use of computerized algorithms, or implies they are a necessary or inherent feature of venture capital investing. As discussed below, patents are granted for computerized algorithms used for determining the value of various goods and

services. It is known to grant a patent on an algorithm used to determine the value of assets to be purchases. For example, US Patent 5,704,044 to Tarter ("Tarter"), used specifically in the health care collectibles field, which is not in the same field as the present invention, discloses an algorithm used to determine the purchase price for medical provider's accounts receivables (col 12., lns. 17-20). As discussed above, accounts receivables have a readily determined value; the algorithm is used to determine the estimated percentage that will be collected.

However, as disclosed in various pieces of prior and concurrent art, and as discussed above, the ability to evaluate intellectual properties was difficult and therefore, investments in intellectual properties did not occur, or was limited and sporadic at best. Because valuation of intellectual properties was difficult and only undertaken by experts, the need for an accurate and consistent method that would provide consistent results was lacking. It is this algorithm for assessing the value of intellectual properties that is unique to the present invention, and the ability to easily and consistently value the intellectual property is what enables the other portions of the present invention: investment in intellectual properties by investors.

Applicant would respectfully show the Examiner that it is known to grant a patent on an algorithm used to determine the value of intellectual property assets. In support of this statement, Applicant would direct the attention of the Examiner to U.S. Patent No. 6,330,547, titled "Method and Apparatus for Establishing and Enhancing the Creditworthiness of Intellectual Property," filed on June 2, 1999 by David Martin, a copy of which is attached hereto as Exhibit 12. This patent is not prior art to the current invention, the application being filed after the provisional application for the present invention; however, it does disclose a method for using computer algorithms to establish a value for intellectual property assets so they can be used as collateral for loans. The method involves analyzing basic information about the patent, including ownership and viability. Once this information is found satisfactory, the next step is to determine a value for the asset by looking at historical data, market projection and statistical information compiled by using the invention, which form part of formulas used to calculate value in this invention. Although this application was filed after that of the present invention, it has already issued, and claims a method for assessing the value of an intellectual property. This value is used

as the basis for obtaining a loan on the intellectual property, rather than as the basis for an investment pool; however, it provides evidence of the fact that a computerized method for assessing the value of intellectual properties as a basis for investment is patentable.

Similarly, US Patent 6,556,992, titled "Method and System for Rating Patents and Other Intangible Assets," the provisional patent application for which was filed on September 14, 1999 is not prior art to the present application, but it also discloses the use of computer algorithms to rate patents, which ratings can be used by valuation professionals. See Abstract, pg. 1. A copy of this patent is attached hereto as Exhibit 13. While this rating does not provide an economic value for a patent, the statistical value assigned to the patent can be used in a further embodiment of the invention as a basis for a method of valuing individual patents. See col. 8, ln 66 – col. 9, ln. 17.

None of the pieces of prior art, alone or in combination, disclose or suggest a computerized algorithm used for determining the value of more than one patent, and pooling funds from various investors to purchase such patents, subsequently license them to third parties, collect royalties from said third parties, and distribute the royalties to the various investors in proportion to the amount of their initial investment. Therefore, Applicant respectfully submits that the present application provides a new and novel invention that should be granted patent protection.

Applicant has now made an earnest attempt to place this application in condition for allowance, and requests the Examiner reconsider the previous rejection of this application. Therefore, Applicant respectfully requests, based on the amendments made, and for the reasons set forth herein, full allowance of Claims 1-3 so that the application may be passed to issue.

A check in the amount of $385.00 for filing of the Request for Continued Examination is enclosed herewith. Applicant believes that no additional fee for the subject document is required. However, the Commissioner is hereby authorized to charge any fee or credit any overpayment with regard to the filing of the subject Office Action Response and Request for Continued Examination to Deposit Account #50-2180 in the name of Paul Storm, P.C.

Respectfully submitted,

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			Feb 10, 1999	Mar 04, 2000	Feb 24, 2001 *	Jan 25, 2002 *	
			Apr 21, 1999 *	Mar 05, 2000	Feb 26, 2001 *	Feb 06, 2002 *	
			Apr 22, 1999	May 19, 2000 *	Mar 01, 2001 *	Feb 22, 2002 *	
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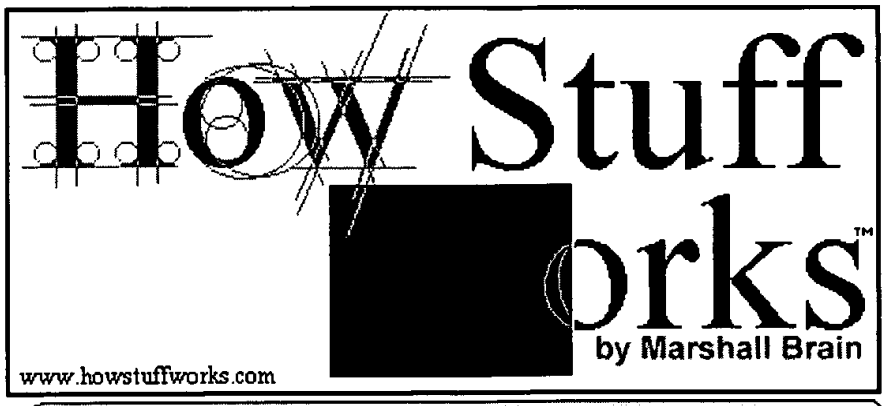

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- What causes high tide and low tide? Why are there two tides each day?
- How do they make maple syrup?
- What is wind chill and does it have any effect on inanimate objects?
- What is "stealth technology" and how does it work?
- Marshall, where do you go when YOU have a question?
- How does dry cleaning work? What is "dry" about it?
- What is a catalytic converter and how does one work?
- Is it possible to tell that the earth is round?
- What is a carat (as in diamonds) and a karat (as in gold)?
- Why do many foods have "High Altitude Cooking Instructions"?
- Why, when the electricity goes out, does the phone still work?
- How does a DVD work?

- What does it mean when a Hard Disk has a Head Crash?
- How does black light work?
- Why do they use salt to melt ice on the road in the winter?
- What is baking powder and how does it work?
- Why don't water towers freeze solid in the winter?
- What is a MiniDisc and how does it differ from a CD?
- What is the world's fastest computer?
- At night, why does it take my eyes several minutes to get used to darkness?
- Why do CDs reflect rainbow colors?
- Why do some people have red eyes in flash photographs?
- How many days will February have in the year 2000?
- How does a heat pump work?
- How does the pop-up timer on a turkey work?
- What is white noise?
- What causes flatulence?
- Why does your body temperature rise when you have a virus such as the flu?
- What is the "Dow Jones Industrial Average" and why do I hear about it on the news every day?
- Why does smoke come from a fire?
- How do touch lamps (lamps that turn on when you touch them) work?
- What causes a rainbow?
- What are atomic clocks and how do they work?
- Why is the sky blue?
- What causes the common cold?
- Why do golf balls have dimples?

- How does a lava lamp work?
- How does a rice cooker know when to turn off?
- Can grass grow in a lava rock as well as it does in soil?
- How did public fountains, like those in Rome, work without any type of motor to pump the water?
- Why are the coils on the backs of refrigerators always painted black?
- What is the difference between analog and digital cell phones?
- How much does planet earth weigh?
- How does reverse osmosis work to filter water?
- How does an Uninterruptable Power Supply (UPS) work on a personal computer?
- What exactly are the "Twelve Days of Christmas"? When do they start and end?
- Why do some dump trucks have extra axles?
- How does the a gas pump know when the tank is full so it can turn itself off automatically?
- How does a 3-way light bulb work?
- What happens if I touch the surface of a CD?
- Why does a fan make you feel cooler?
- How do digital answering machines work?
- How does a car's rearview mirror work when it's set on the upwards, "glare resistant," setting?
- How far does ultraviolet light penetrate into the body?
- How does an X-Ray machine work?
- How does a kidney dialysis machine work?
- How many sheets of paper can be produced from a single tree?
- Can you explain pressurized airplane cabins?
- How does a water cooled air conditioner work?

- What actually does it mean when a barometer is rising or falling?
- How do they make helium?
- How does a computer's parallel port work and how can I design things to attach to a parallel port?
- What causes helium ballons to lose their lift after a day or two?
- What is a glacier?
- What is the oscilloscope used to measure?
- Can you explain the basic diference between analog and digital technology?
- What is the function of the fan within the refrigerator?
- How do you write the chemical reaction that takes place in the smoke detector?
- Do certain radio wave frequencies pose health risks?
- What force causes a 3-pole motor to spin one way and not the other?
- How can I make my own battery to win a contest at school?
- Why do you hear some radio stations better at night than in the day?

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The following sites also have answers to hundreds of questions, and will be very helpful if you are looking for something specific:

- Science Net - answers to many science questions
- How things work - andswers to hundreds of general and physics questions
- Sci.chem FAQ - answers to many chemistry questions
- The Skinny on... - look at bottom of the article for a list of others

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- How do stock options work, and why are they better than cash compensation?
- How do store coupons work? How does the store get its money back?
- How does Venture Capital work?
- How does the Social Security system work? When I pay into the system, where is my money held?
- What is a smart card?
- How do dollar bill changers work -- like the ones you see at arcades that accept a bill and return coins? How do they verify the bill and detect its denomination?
- If all the money in the U.S. only totals $6 trillion, how can the New York Stock Exchange have stocks valued at $15 trillion?
- If I had "all the money in the world", how much money would that be?
- Where are all of these funny looking quarters coming from?
- What is the total amount of gold that man has mined since 3000 B.C.? How much is it worth?
- How do the counterfeit detector pens that you see at convenience stores work?
- Why does normal paper dissolve in the washer but dollar bills remain intact?

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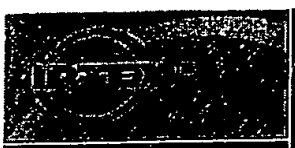

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What Is IPTEX

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IPTEX is a business-to-business extranet for technology licensing professionals. It facilitates a network of targeted communications between technology transfer offices at research institutions and corporate technology developers.

IPTEX participation is restricted to approved users. Access to IPTEX services is password protected and secure. Three categories of users are are authorized to use IPTEX:

- Qualified technology transfer officers from accredited research institutions.
- Qualified corporate licensing professionals capable of bringing early stage inventions to market, or otherwise providing significant value added development.
- Qualified venture capitalists capable of providing financial assistance to commercialization efforts.

What IPTEX Does >>

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What IPTEX Does

IPTEX allows licensing professionals at research institutions and corporations to efficiently and thoroughly target one another for a series of communications.

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IPTEX Provides

- Research institutions with the ability to send non-confidential descriptions of available technology to all appropriate recipients in a single active step. A list of recipients is immediately returned to the research institution.
- Corporate users with the ability to be immediately notified of technology matching their predefined interests from anywhere in the world, as the innovations emerge.
- Other labor and time saving features to be announced soon.

How It Works >>

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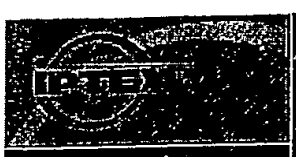

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IPTEX is straightforward and powerful. At one end, research institutions provide non-confidential descriptions of their new technologies. On the other end, corporate licensing professionals register searches for each specific licensing interests. Each day, IPTEX sends complete invention descriptions to those licensing professionals whose searches match. IPTEX then returns to each research institution a list of corporate recipients for each technology matched.

This process represents a revolutionary advancement in academic technology marketing. Research insitutions simply describe their technologies and corporations simply describe their interests; IPTEX makes the matches and provides full information to both sets of users.

Advantages >>

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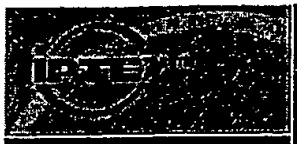

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Not a Passive Search List. Passive databases do not return information to universities about the searches performed on their technologies. These lists are frequently used by universities as a last resort, which means that their quality of their listings can vary.

Active. On a daily basis, our server automatically pulls in technology descriptions from universities and pushes them out to interested corporate licensing professionals.

Accurately Targeted. Corporate licensing professionals control what they receive by maintaining their own searches, which they can change and fine-tune as desired, and universities receive a list of recipients of their technology descriptions.

Reduces Marketing Effort. Technology Exchange reduces the academic and corporate marketing process to a single step for the accurate and thorough distribution of new technologies. Technology Exchange is desgined to create no "extra work" to use it.

Insider's Service. Membership is restricted to legitmate research institutions and companies capable of commercially developing early stage technologies. Whether seeking new technology or a commercial partner, our up to date system will put you in touch with just the right people.

Single Source. Technology Exchange's unique advantages for universities and companies will make it the single source for new technology licensing opportunities, greatly simplifying the marketing process.

Free. The service is currently free.

Obligations >>

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Obligations

Research institution are given access to IPTEX free of charge. IPTEX only asks that the system be used responsibly, only genuine inventions be listed, and technology descriptions be as thoughtfully prepared.

Corporate users will be asked to pay reasonable annual subscription fees in mid 1999. A schedule of charges will be released shortly.

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Simply register your organization by filling out the appropriate form. Registrants must represent established research institutions or companies capable of commercially developing early stage technology. Registration must be approved by Technology Exchange.

Registration Forms:

Research Institute Form
Company Form

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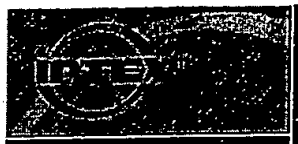

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Research Institution Registration Form

If your institution has more than one independently functioning office, you may want to register each one separately. Technology Exchange will interact directly with those offices which are registered.

Institution Name
Address
Address http://

PRIMARY CONTACT - Point Person to Interact with IPTEX

First Name
Middle Initial
Last Name
Degree/Title (e.g. Ph.D., Esq., MBA)
Job Title (e.g. Director R&D)
Phone (incl. area code)
E-Mail
Fax

REGISTER CLEAR FORM

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How To Join

Company Registration Form

Register Here As A Technology Recipient. Each person who wants to receive technologies needs to register independently, even if there are many people from the same company.

Corporate User Information

First Name

Middle Initial

Last Name

Degree/Title
(e.g. Ph.D., Esq., MBA)

Job Title
(e.g. Director R&D)

Address

Phone
(incl. area code)

E-Mail

Fax

Company Information

If your company appears on this list then select it:

<none of these>
Abbott Laboratories
Access Management Services, Inc.
Acorda Therapeutics, Inc.
ACT Medical

If none of the above, new company name:

E-Mail Format

- (•) Send me each technology as a separate email with the reply set to the research institution contact for each technology.
- ( ) Send me all technologies matching my interests in the body of one email message with reply set to Technology Exchange.

REGISTER CLEAR FORM

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1998 Year End Progress Report

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Background
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Comments from Your Colleagues
Recent Improvements
Non-Exclusive Licensing of Lab Tools and the NIH
Future Directions.

Background

The idea of the Intellectual Property Technology Exchange ("IPTEX") is rooted in the Yale University Office of Cooperative Research — where a highly active and successful licensing office recognized the need for improved licensing efficiency.

Our intention is to create a more efficient and liquid technology transfer process through the automatic matching of licensing opportunities with appropriate commercial developers. Disappointed with the many posting and matching services, we designed an "extranet" limited to appropriate professionals for efficient communication, technology matching, and tracking of activity. This network functions through the active participation of its users which ensure the quality of the network. As the IPTEX evolves, a range of additional services will be offered to support this activity, such as rapid exchange of routine agreements (CDAs, MTAs, , and licenses for lab tools).

Exciting things are in store for IPTEX in the coming year. In addition to a name change (to be announced), IPTEX will become a private company — wholly independent of Yale University - dedicated to providing even more professional services to its users. More on these developments will appear in early 1999.

Growing Activity

In the seven months since IPTEX was officially launched, it has succeeded in enabling universities to distribute new technologies, in a single step process, to a self-selected group of licensing professionals from a large number of major pharmaceutical and biotechnology companies in a single step. Similarly, IPTEX has enabled corporate users to be automatically notified of inventions matching their interests from any of over 100 major research institutions..

As of December 1998:

- Technology Matches Made — over 20,000 (technology descriptions delivered to matching company interests)
- Technologies Currently Listed — Over 950
- New Technologies Listed Weekly — 30 (50% of all new life sciences technologies marketed, based on AUTM statistics)
- Universities and Non-Profit Research Institutions — 102 (complete list at the IPTEX website), including 171 individual professionals
- Corporations — 263 (complete list at the IPTEX website), including 338 individual professionals

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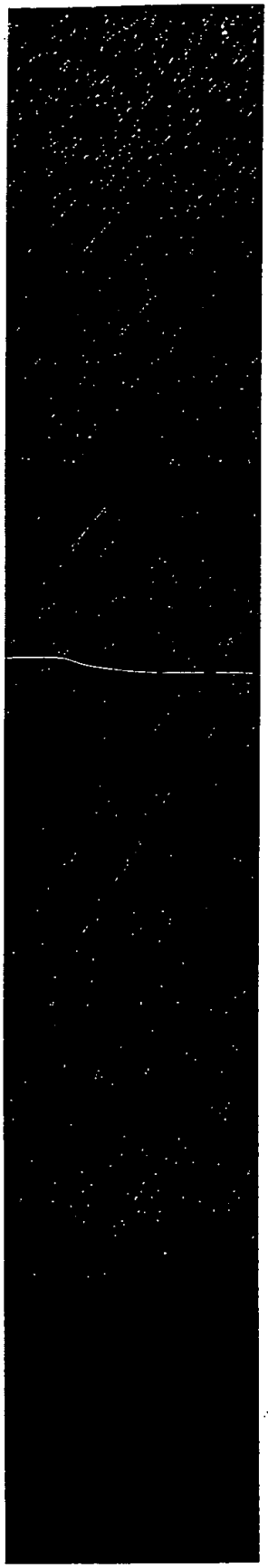

- Countries Represented — 10 (US, UK, Canada, Ireland, Brazil, Germany, Belgium, Sweden, Australia and Italy)
- NIH Funded Research Represented — Approximately 40%
- On average, each technology posted matches the interests of 22 corporate professionals.
- On average, corporate licensing professionals receive 5 technology disclosures per week targeted exactly to their interests.
- IPTEX receives approximately 5,000 visits monthly from 650 unique locations.

Comments from Your Colleagues

IPTEX recently solicited comments from its users to be incorporated into this document. We were pleased at the level of the responses and encouraged that the feedback was very positive. You can see the comments for yourself by selecting from the list below:

Company

Yi-Her Jou, New Business Ventures Manager
Abbott Diagnostics Division
Philippe Fonjallaz
Ares Serono
David Wood, Sr. Licensing Officer
Bayer Pharmaceuticals
Lamar Chandler, Product Development Engineer
Becton Dickinson Ophthalmic Systems
Leslie Coney, Associate Director of Technology Transfer
Biogen
Joseph Rosa, Director of Science and Technology
Biogen
Madelyn Baran
BioSource International
Joey Mason
Biotrin International
Fran Bailey, Partner
Blue Hills Venture
David Asa, VP Technology Development
Bridge Scientific
Chris Utz, VP Diagnostics L&A
Carter-Wallace
Alex Strongin, Director of Business Development
Chemicon International
Matt Roth
Curagen
Dick Haiduck, President & CEO
Desmos
Sam Ronel, Chairman
Interferon Sciences, Inc.
Weaver Gaines, Chairman & CEO
Ixion Biotechnology, Inc
David Epstein, Principal Scientist
Life Technologies
Tony Hickson, Corporate Development

Research Institution

Laurine Speights
BioServe Space Technologies
David Fielder
California Pacific Medical Center Research Institute
Terry Johnson
Kansas State University
Cynthia Gawron-Burke, Director,Technology Transfer
The Children's Hospital of Philadelphia
Gina Bicknell
University College London Ventures
Shannon Davis
University of Arkansas Office of Technology Licensing
Steve ONeil, Director
University of Colorado
Andreas Bohlen
University of Potsdam, Germany
Branko Peterman, President and CEO
University of Saskatchewan Technologies Inc
Sharon Stueckle
Vanderbilt University
Bryan Macy
Wake Forest
William Sellers, Director
Wright State University
Margaret Kerr
York University

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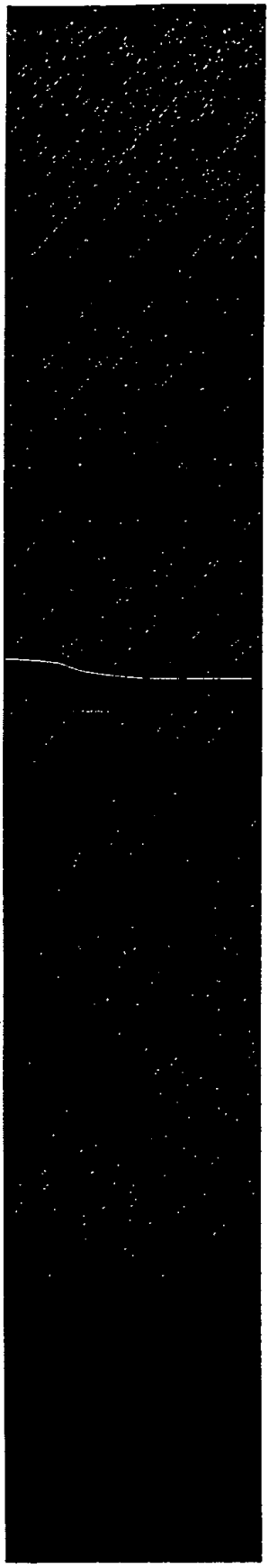

Murex
Karen Padgett, President
Novus Biologicals
Eric Hohenschuh, Sr. Licensing Associate
Nycomed Amersham
David Englert, Director, Applied Research
Packard Instrument Company
Han Park
Paramount Capital
Bill Heyd, Director
Pharmacia & Upjohn
Carl Clark, Technology Transfer Manager
Pierce Chemical Co.
Paul Rohricht, U.S. Business Manager
PPL Therapeutics
Luc Péloquin, Director of Research and Development
Quantum Biotechnologies, Inc.
ALLEN BARNETT, Vice President
Schering Plough
Larry Kauvar
Trellis Bioinformatics
Ray Guimont, Global Technology Manager
Warner Lambert Company
Chris Dippel, Manager, Corporate Development
Wyeth-Ayerst Laboratories
Jit Patel, US Collaborations Manager
Zeneca Pharmaceuticals

Recent Improvements.

"Disclosure Date" Changed to "Date Last Updated"

This modification was made due to concerns expressed regarding the potential legal implications of the term "disclosure date", combined with uncertainty as to how changes to existing technology descriptions would be indicated. This new terminology is meant to "date" the information in the description without the resulting legal or bureaucratic implications for the university technology transfer offices.

Flow Control for New Corporate Users.

Because the IPTEX database has grown so quickly, new users are now finding that their queries may result initially in large numbers of matches. In order to make this first experience with IPTEX more manageable, new users can now opt to limit the inflow from their queries at a customized rate. First, all new or edited searches will be quickly screened against the database to inform the user of the size of the initial inflow. Second, a user-selected limit on the number of new technologies sent per day is set in the Account Manager section of the user's IPTEX account. This number is 10 by default. The newest technologies will arrive first and each day the daily limit of technology will be forwarded until the backlog is finished

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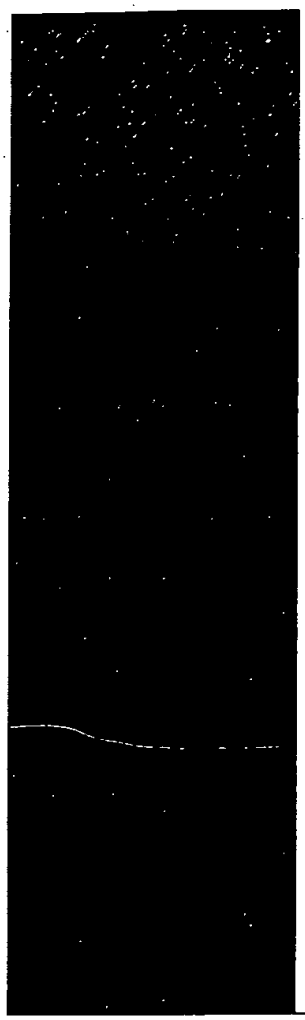
Non-Exclusive Licensing of Lab Tools and the NIH.

NIH has expressed some concern regarding broad licensing of lab tools which were created using NIH funding. It is their position that it is



in the public interest for lab tools to be licensed as broadly as possible. However, many universities license lab tools exclusively, or non-exclusively but only to a small number of companies. The university argument (often de facto) is that these tools are low-value, and do not justify the effort required to license broadly. This market is highly inefficient, as many companies have no means to discover what tools are available to meet existing needs.

IPTEX offers a way to mitigate this problem. Once a lab tool technology is posted on IPTEX it is immediately sent to all company users with matching interests. Using IPTEX, very little effort on the part of universities is required, but information about availability is widely distributed. Looking to the future, IPTEX's proposed Rapid Agreement Requests for licensing of reagents —currently being implemented for Yale University and soon available to all universities — will make the broad licensing of lab tools practically effortless.

Future Directions.

In order to better serve both research institution and corporate users, IPTEX will soon be incorporated as a stand-alone company.

Improvements to the user interface are planned for the first quarter of 1999, along with incremental enhancements to core functionality. During the latter half of 1999, you can expect greatly expanded features — all designed to improve the efficiency of the marketplace and simplify your own use of IPTEX.

This is a critical juncture for IPTEX, and your suggestions and comments are essential. Please take a few minutes to complete this online Questionnaire, so that we can build IPTEX to more effectively serve your needs.

Please contact Jon Garen at (203) 432-8932 or jon.garen@yale.edu if you have any questions or suggestions.

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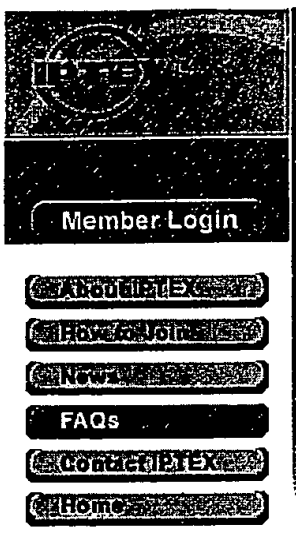

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Universities

- **How is Tech Ex better than other services?** Technology Exchange is the only fully active and interactive technology marketing service available (see Advantages on the About Tech Ex page). By pushing technology directly to appropriate recipients, based on their own self-described interests, and returning a recipient list to universities this service will replace current marketing practices with a more efficient and better targeted approach.
- **Does it cost anything?** No. This service is completely free to Universities.

Companies

- **Will I be inundated with technologies?** No. Technology Exchange is NOT a data dump. We only distributes new technologies. Using AUTM survey and university provided data, we estimate that no more than 6 technology descriptions will come to Technology Exchange per day. Even if you had everything delivered to you, it would not be an overwhelming amount. Using some simple search criteria to limit technology returned would further reduce the number. We have implemented a key word list and created an intelligent search-building form to help you create useful searches and accurately target technologies of interest to you (see Searches).
- **If I Register Searches with you is the information secure?** Yes. A Detailed description of our web security measures is given in the security section. Technology Exchange fully recognizes the need for tight security and has implemented very strong measures.
- **How much does it cost?** Nothing. The service is completely free. At some point in the future, there will be an annual subscription fee for unlimited use of the service.

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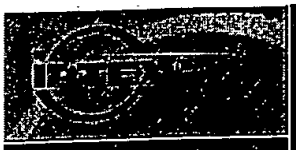

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Contact IPTEX

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Licensing Associate

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New Haven, CT 06520-8336

Phone: 203 / 432-8932
Fax: 203 / 432-5449
Email: jon.garen@yale.edu

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Today's New Inventions

There are 4 new technologies on 19-Apr-1999.

Date	Title
19-Apr-1999	Novel Diagnostic Marker and Therapeutic Target for Prostate Cancer: pp32
19-Apr-1999	Fatty Acid Synthase: A Novel Therapeutic Target and Diagnostic for Cancer, Tuberculosis, Fungi
19-Apr-1999	Gene Targeting in Vertebrate Zygotes
19-Apr-1999	Expression Control Technology for Gene Therapy Products

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Research Institute Activity

142 research institutions are enrolled in IPTEX.

Alphabetically Click here to list by Number of Inventions.	Inventions Listed
American Pharmed Labs	0
Antigen Express, Inc. [U. Mass. Med. Ctr.]	0
ARCH Development Corporation	0
Auburn University	2
Axiom Biotechnologies	0
Beth Israel Deaconess Medical Center	0
BioResearch Ireland	10
Boston University	0
Bristol University, UK	4
Brown University Research Foundation	1
California Institute of Technology	0
California Pacific Medical Center, Research Institute	2
Canadian Bacterial Diseases Network	0
Children's Hospital of Philadelphia	12
Cornell Research Foundation, Inc.	10
Dana-Farber Cancer Institute	11
Delft University of Technology; Micro Engineering	0
Duke University	17
Fox Chase Cancer Center	20
Fred Hutchinson Cancer Research Center	7
GBF, Gesellschaft für Biotechnologische Forschung mbH (The German National Research Centre for Biotechnology)	0
Georgia Institute of Technology	19
Harvard University	20
Howard Hughes Medical Institute	0
ID-NL Group	0
Institute of Medical and Veterinary Science	0
Interface Entreprises-Université de Liège (liaison office)	0
Iowa State University	46
Isis Innovation (University of Oxford)	11
Johns Hopkins University School of Medicine	55
Kansas State University Research Foundation	16
Kansas State University/BioServe Space Technologies	7
Karolinska Innovations	0

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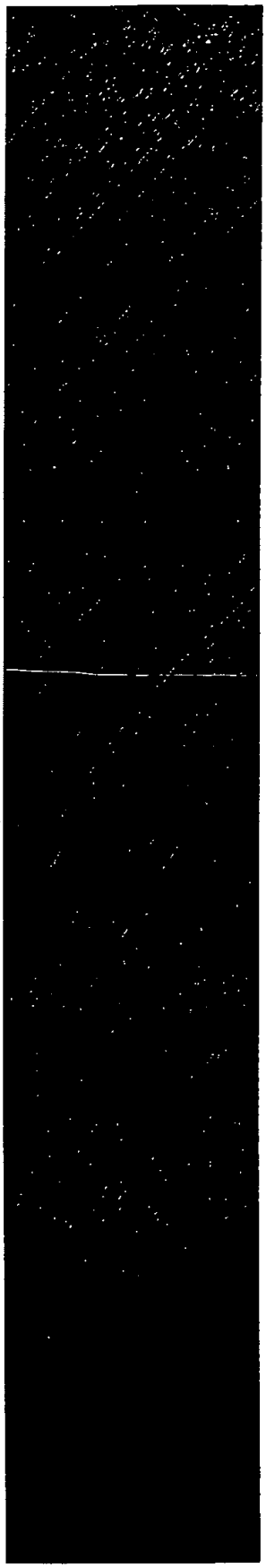

Keele University	0
Kent State University	1
Louisiana State University	66
LWB Development	0
Massachusetts Institute of Technology	0
Mayo Clinic/Mayo Medical Ventures	4
McGill University	15
MCP Hahnemann University	10
Medical College of Georgia Research Institute, Inc.	0
Medical Research Council	0
Medical Research Council Human Genetics Unit	0
Memorial Sloan-Kettering Cancer Center	1
Michigan State University	0
Mount Sinai Hospital	0
MRC Collaborative Center Scotland	2
MUSC Foundation for Research Development	29
Natural Resources Canada, Canadian Forest Service	0
NDSU Research Foundation	0
NDSU Research Foundation	11
New England Medical Center	0
New York Blood Center, Inc.	18
New York Medical College	1
Newcastle University	0
Northeastern Ohio Universities College of Medicine	1
NTTC	0
Oregon Health Sciences University	5
Oslo Research Park	0
Oxford Bio-Innovation Ltd	0
PADETEC - Universidade Federal do Ceará	0
Princeton University	14
Queen's University of Belfast	0
San Raffaele Biomedical Science Park	11
Science & Technology Corporation at the University of New Mexico	0
St. Jude Children's Research Hospital	8
Stanford University	0
State University of New Jersey	8
State University of New York at Stony Brook	11
TEL-AVIV UNIVERSITY	0
Temple University	17
Texas A&M University	0
The Hospital for Sick Children	6
The John P. Robarts Research Institute	8
The Pennsylvania State University/Intellectual Property Office	0

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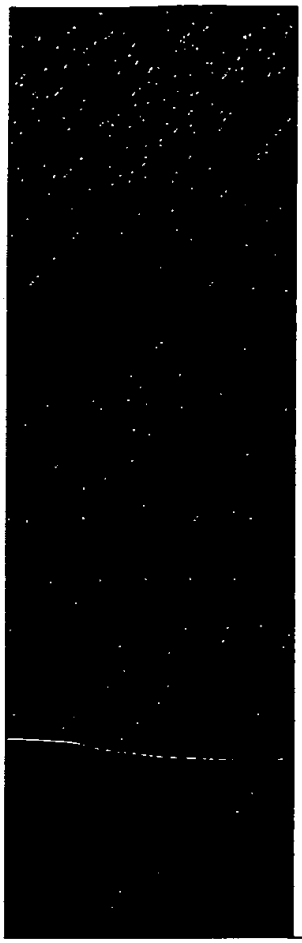

University of Washington	8
University of Western Ontario	0
University of York	0
University Technologies International Inc./ University of Calgary	0
University Technology Corporation (U of CO.)	21
Université Catholique de Louvain	7
Université Libre de Bruxelles	3
US National Institutes of Health	130
Vanderbilt University	22
Virginia Commonwealth University	0
Virginia Tech Intellectual Properties, Inc.	0
Wake Forest University School of Medicine	1
Washington University	1
Wayne State University	0
Weizmann Institute of Science	0
Wellcome Trust	0
Wheeling Jesuit University	0
Wistar Institute	29
Wright State University	8
Yale University	51
Yeda R&D the Weizmann Institute of Science	0
York University	1

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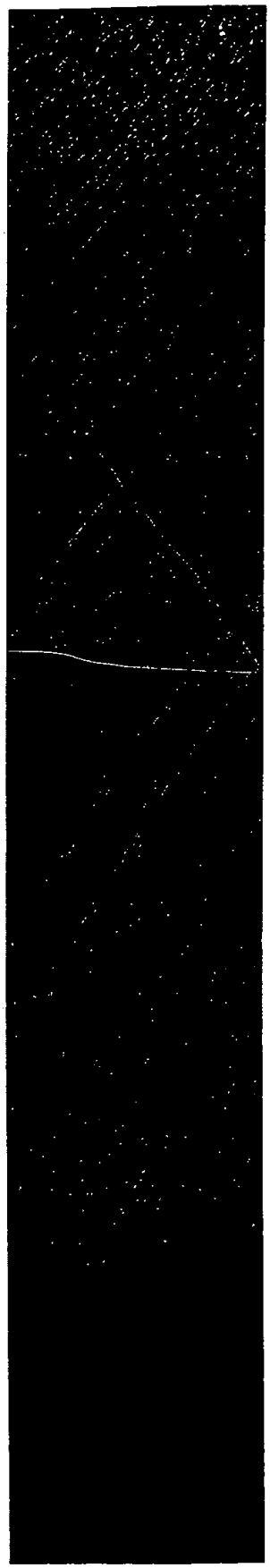

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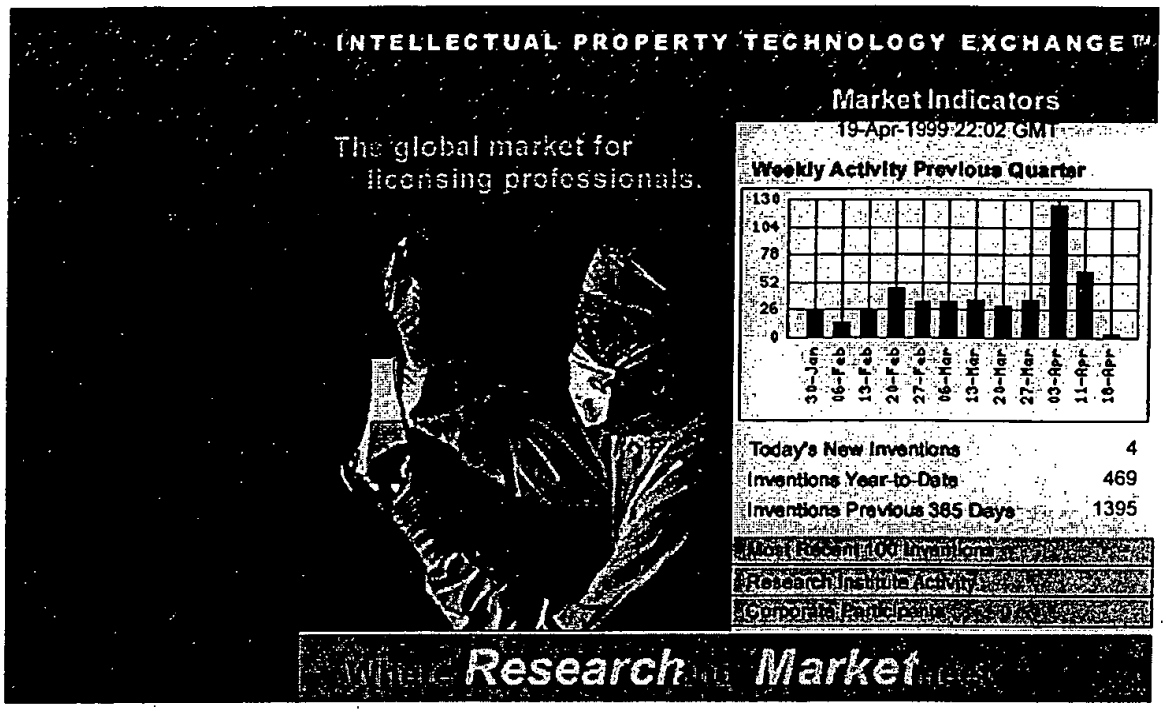

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Third DAS Workshop and Eighth Workshop of the DGOR Working Group

Decision Theory and Decision Support

February 25-27, 1998
IIASA, Laxenburg, Austria

Agenda

Wednesday	**Opening Plenary**		***Wodak Room***	
9:00-10:00	Gordon MacDonald, Director, IIASA		Welcome	
	Jill Jaeger, Deputy Director, IIASA		Introduction	
	Pekka Korhonen, Project Leader, DAS		DAS Project and Workshops	
	Gert Wanka, Chairperson, DGOR		DGOR Workshops	
Coffee Break				
Wodak Room			***Seminar Room***	
10:30-12:00	**Group Decisions and Rationality**	**R. Vetschera**	**Optimal Control**	**U. Krallert**
	Consensus in Group Decision Making	Alan Pearman, Leeds University, UK	The Spline Approximation for the Solution of the Problem of Optimal Control	Aram Arakelyan, State Engineering University, Armenia
	Some Models of Rational Behavior around Acyclicity	Carlos Rodriguez-Palmero, University of Valladolid, Spain	A Game Theoretic Approach to the Optimization of FDDI Computer Networks	Johannes Jahn, University of Erlangen-Nürnberg, Germany
	A DSS for the Choice of Incentive Strategies in Multicriteria and Multiactor Problems	Michel Installe, Catholic University of Louvain, Belgium	Duality for Multiobjective Control-Approximation Problems with Gauges	Uwe Krallert, Technical University, Chemnitz, Germany
Lunch Break				
13:30-15:00	**Risk, Uncertainty, and Fuzzy Problems**	**W. Michalowski**	**Applications: Business and Environment**	**G. Fandel**
	Fuzzy Inference Using Vague Input Data	Heinrich J. Rommelfanger, J.W. Goethe University, Germany	Computer-Based Marketing Decision Support Systems in Polish Companies	Witold Wilk, Higher School of Business, Poland
	General Risk Constraints	Love Ekenberg, Mid Sweden University, Sweden	Multicriteria Decision Making on Water Resources Planning	Victor Sousa, University of Porto, Portugal
	Decisions under Risk - Stochastic Dominance and Mean-Risk Approaches	Wlodzimierz Ogryczak, Warsaw University, Poland	A Decision Support System for FMS Scheduling (Software Demonstrations)	B.Bossert, University of Hohenheim, Germany
Coffee Break				
Wednesday (cont.)				

	Wodak Room		*Seminar Room*	
15:30-17:00	**Group Decisions**	**G. Kersten**		
	Multiagent Decision Processes in Cultural Heritage Conservation	Grazia Concilio, University of Naples, Italy	Software demonstrations	
	A Multicriteria Agency Model with Incomplete Preference Information	Rudolf Vetschera, University of Vienna, Austria	Software demonstrations	
	Problem Solving in Negotiation Process	Petr Fiala, University of Economics, Czech Republic		

THURSDAY

	Wodak Room		*Seminar Room*	
9:00-10:30	**DAS Workshop: Academic Evaluation**	**P. Korhonen**	**Applications: Finance**	**W. Ogryczak**
	Redistribution of Funds for Teaching and Research among Universities	Günter Fandel, Fern University, Hagen, Germany	Random Approximations in Multiobjective Programming with an Application to Portfolio Optimization under Probabilistic Constraints	Silvia Vogel, Technical University, Ilmenau, Germany
	The Assignment of Grades	Freerk A. Lootsma, Delft University, The Netherlands	Multicriteria Optimization of Portfolio Investments Using the Reference Multifunctions	Andrzej Skulimowski, University of Mining and Metallurgy, Poland
			Duality for Portfolio Optimization	Gert Wanka, Technical University, Chemnitz, Germany
	Coffee Break			
11:00-12:00	**DAS Workshop: Academic Evaluation**	**P. Korhonen**	**Algorithms**	**M. Ehrgott**
	Roundtable discussion	Pekka Korhonen, DAS Project, IIASA, Austria	Theoretical Bases of Comparability Measures in Multi-Criteria Decision Making	Jozsef Dombi, Szeged University, Hungary
		Günter Fandel, Fern University, Hagen, Germany	N Points Rapprochement Problem Under Disturbances	A. Topchishvili, Georgian Academy of Sciences, Georgia
		Freerk A. Lootsma, Delft University, The Netherlands	A Link Between Efficiency and Satisfaction: The Goal Sequential Improvement Algorithm	Rafael Caballero, University of Malaga, Spain
	Lunch Break			
13:30	***Excursion***			

FRIDAY

	Wodak Room		*Seminar Room*	
9:00-10:30	**DAS Research at IIASA (1)**	**F. Lootsma**	**Optimization**	**D. Schweigert**
	Regret Revisited: How to Find Non-Regrettable Solutions for the MCDM Problem	Wojtek Michalowski, DAS Project, IIASA, Austria	Convex Operators in Multicriteria Problems	A. Topchishvili, Georgian Academy of Sciences, Georgia
	A Note on Efficient Solutions for the Linear Bilevel Programming Problem	Margareta Soismaa, DAS Project, IIASA, Austria	Multicriteria Optimization Problems: Classification and Axiomatic Characterization	Matthias Ehrgott, University of Kaiserslautern, Germany
	Searching the Efficient Frontier in DEA	Pekka Korhonen, DAS Project, IIASA, Austria	Global Multiobjective Optimization with Evolutionary Algorithms	Thomas Hanne, Fern University, Germany
	Coffee Break			
11:00-12:00	**DAS Research at IIASA (2)**	**M. Soismaa**	**Individual and Group Decisions**	**A. Pearman**
	Behavioural Issues in MCDM and Decision Support	Pekka Korhonen and Gregory Kersten, DAS Project, IIASA, Austria	On the Synergism in the Analytical Hierarchy Process	D. Schweigert, University of Kaiserslautern, Germany
	Automated Negotiation via an Intelligent Agent	Gregory Kersten, DAS, IIASA, Austria	Cooperation and Incentives in Groups	Michael Krapp, University of Augsburg, Germany
	Lunch Break			
13:30-15:00		**G. Wanka**		
	COMPETENCE: An Internet-Based Information and Training System	R. Scheubrein, University of Hohenheim, Germany	Software demonstrations	
	Approaches to Multicriteria Decision Making under Incomplete Information	Anna Perekhod, University of Kaiserslautern, Germany	Software demonstration	
15:00-15:30	**Closing remarks**: G. Kersten and R. Vetschera			

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Dramatic population aging may threaten Europe's social and economic well-being. To help policymakers respond to this predicament, IIASA's Population Project (POP) has recently established collaboration with the Vienna Institute of Demography (of the Austrian Academy of Sciences) and other European demographic institutes. Read the new issue of POPNET (pdf), to learn what POP project leader Wolfgang Lutz and his colleagues say about the European demographic challenge and the work of this alliance.

Farewell Summer Students 2003

At the end of August, IIASA said goodbye to the 53 students from 27 countries who took part in the 2003 Young Scientists Summer Program (YSSP). At a traditional farewell dinner (photos), they received their certificates and presented an engaging summary of their IIASA experience.

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Subject: Article in our journal

In response to your kind query: the paper by Renata Mansini and Maria Grazia Speranza, entitled: "Selection of lease contracts in an asset-backed securitization: a real case analysis" was published in "Control & Cybernetics", issue 4, vol. 28 (1999), pp. 739-754. This was a special issue devoted to "Portfolio Optimization", guest-edited by W³odzimierz Ogryczak and Gregory Kersten.

With best regards,
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At 18:01 16-09-03 -0500, you wrote:

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Renata **Mansini** è nata a Salò (Bs) il 22 agosto 1968. ... Renata **Mansini**. DEA, Università di Brescia. Via Branze,38 ... solidi nella città di Brescia", relatore Prof.ssa M.G. **Speranza**. Per il lavoro di tesi svolge circa un anno di ...
www.ing.unibs.it/~rmansini

41. mansini
Renata **Mansini** è nata a Salò (Bs) il 22 agosto 1968. È ricercatrice per il settore scientifico A04B (Ricerca Operativa) presso la Facoltà di Ingegneria dell'Università degli Studi di Brescia, Dipartimento di Elettronica per l'Automazione. ... Renata **Mansini**. DEA, Università di Brescia. Via Branze,38 ... solidi nella città di Brescia", relatore Prof.ssa M.G. **Speranza**. Per il lavoro di tesi svolge circa un anno di ...
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Monday, 19th February, 2001 (Click on the titles in order to view an abstract) Chair: de Koster Visit of the Abbey Cathedral Visit of the Abbey Library ... Session 1. Chair: **Speranza**. 09:00. –. 09:30 ... 15:30. Renata **Mansini** and Enrico Angelelli, Unversity of Brescia ...
troubadix.unisg.ch/klose/iwdl-web/monday.html

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... Vittorio Maniezzo. Carlo Mannino. Renata **Mansini**. Francois Margot. Fabrizio Marinelli ... Emilio Spedicato. Maria Grazia **Speranza**. Fabio Stella. Giovanni Storchi ...
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45. Organi statutari ed Aderenti / e-mail
... Brescia. Matematica(Ingegneria). **SPERANZA** Maria Grazia. Matematica Finanziaria. Brescia ... Matematica(Ingegneria). **MANSINI** Renata. Ricerca Operativa. Brescia. DEA (Ingegneria) ...

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ESAME DI SINTESI 2003 La Teologia Fondamentale studia l'evento della divina rivelazione con la quale Dio Trino "nel suo immenso amore parla agli uomini come ad amici... per invitarli e ammetterli alla comunione con sé" (DV 2). ... "pronti sempre a rispondere a chiunque vi domandi ragione della **speranza** che è in voi" (1Pt 3,15), la Fondamentale si ...
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Il mio blog personale. Weblog: sito web a metà fra diario personale e giornalismo online. Crea il tuo blog gratis con Splinder. ... La mia **speranza** sarebbe cadere dritto nell'oceano come una navicella spaziale (senza bruciarmi le piume ... da difensore e si pronuncia, credo, **Mansini**. Ora Capello l'ha trasformato ...
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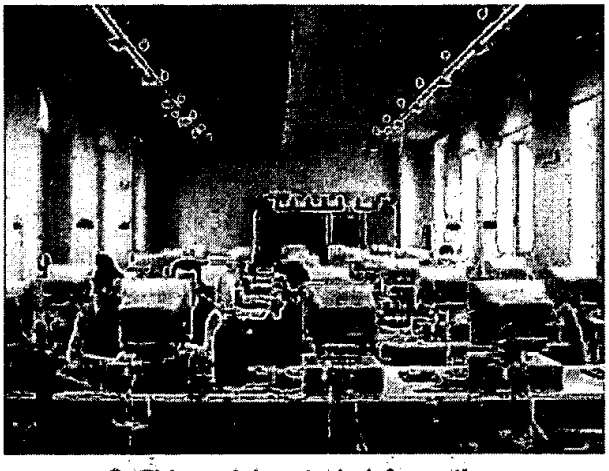

S. Chiara - laboratorio informatico

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SE

- Pagine dei S

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US006330547B1

(12) **United States Patent**
Martin

(10) **Patent No.: US 6,330,547 B1**
(45) **Date of Patent: Dec. 11, 2001**

(54) **METHOD AND APPARATUS FOR ESTABLISHING AND ENHANCING THE CREDITWORTHINESS OF INTELLECTUAL PROPERTY**

(75) Inventor: **David E. Martin**, Charlottesville, VA (US)

(73) Assignee: **Mosaic Technologies Inc.**, Charlottesville, VA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/324,871**

(22) Filed: **Jun. 2, 1999**

(51) **Int. Cl.**[7] **G06F 17/00**

(52) **U.S. Cl.** **705/38**

(58) **Field of Search** 705/1, 35, 36, 705/38, 39, 4.8

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Primary Examiner—James P. Trammell
Assistant Examiner—Pierre E. Elisca
(74) *Attorney, Agent, or Firm*—Peter E. Rosden

(57) **ABSTRACT**

A method and apparatus for deciding whether to make a loan using an intangible asset, such as intellectual property, as collateral and for making such a loan more attractive to a lender. The method requires that an assessment of the transferability and viability of the asset be made to determine if the asset and loan applicant meet minimum qualifying criteria. If they do, a more detailed analysis is undertaken in which judgments are reached concerning various factors related to historical, comparative and prospective market behavior in market sectors identical with, as well as parallel and corollary to the primary market sector for the asset sought to be used as loan collateral. The analysis leads to calculation of an asset liquidation value and production of a correlated depreciation schedule which are both presented to the prospective lender. A third party then contracts with the lender to pay the asset liquidation value to the lender, adjusted for depreciation over time, in the event that the loan applicant defaults on the loan. This arrangement reduces the lender's risk of loss thereby making the loan more attractive. A computer-based apparatus for carrying out the method is also disclosed.

22 Claims, 6 Drawing Sheets

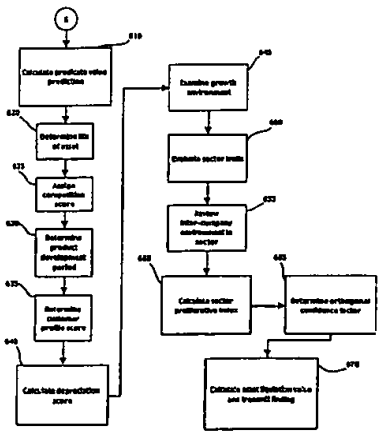

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FIG. 1

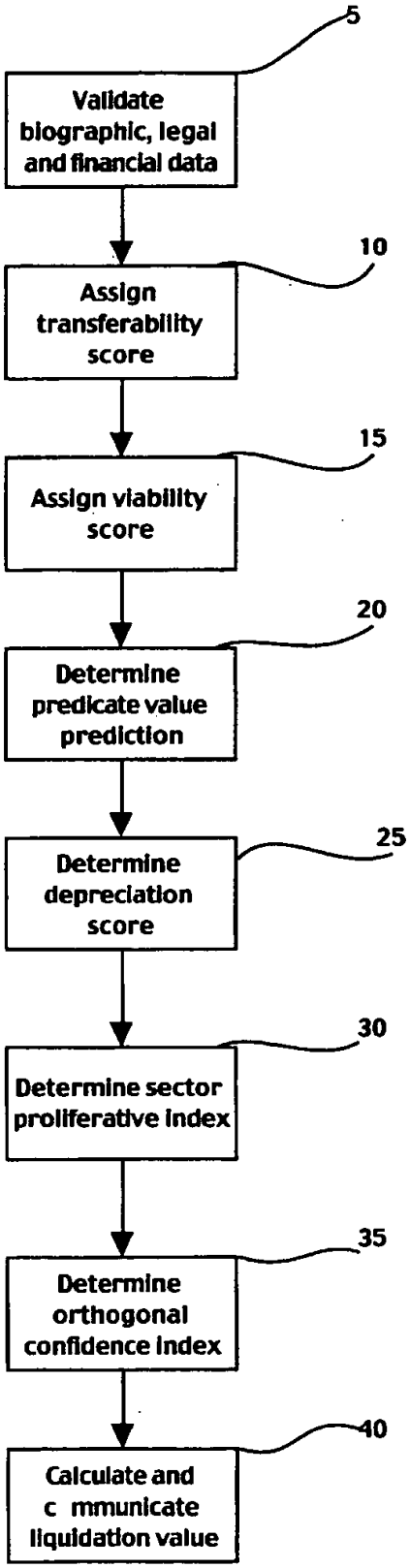

5
Validate biographic, legal and financial data
10
Assign transferability score
15
Assign viability score
20
Determine predicate value prediction
25
Determine depreciation score
30
Determine sector proliferative index
35
Determine orthogonal confidence index
40
Calculate and c mmunicate liquidation value

FIG. 2

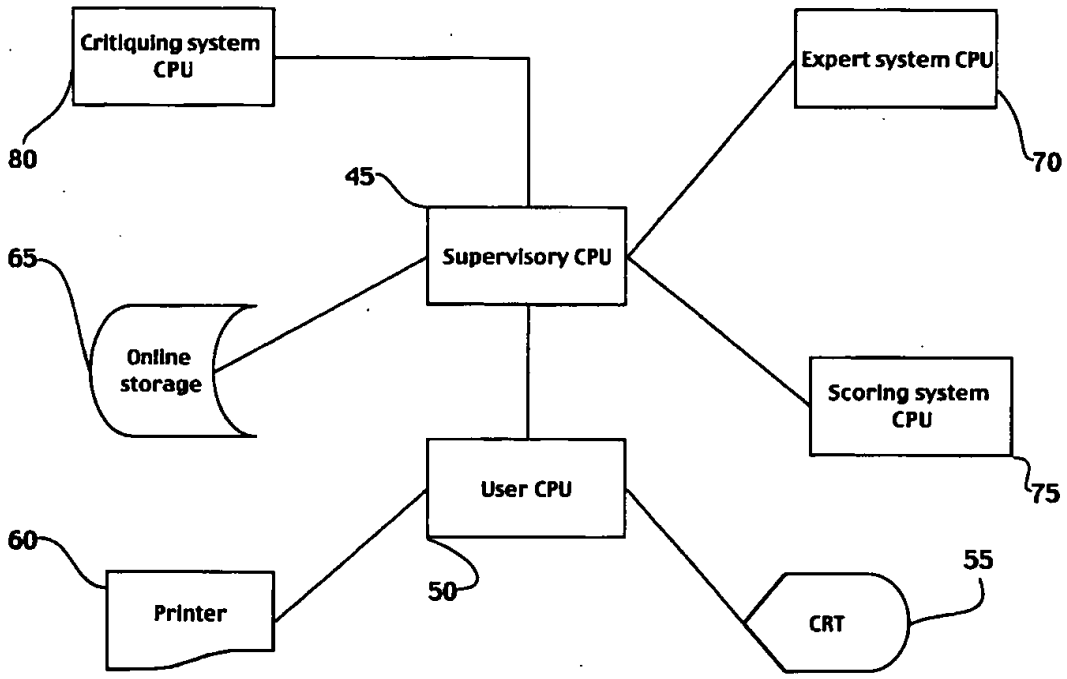

Critiquing system CPU
80
Expert system CPU
70
45
Supervisory CPU
65
Online storage
Scoring system CPU
75
User CPU
60
Printer
50
55
CRT

FIG. 3

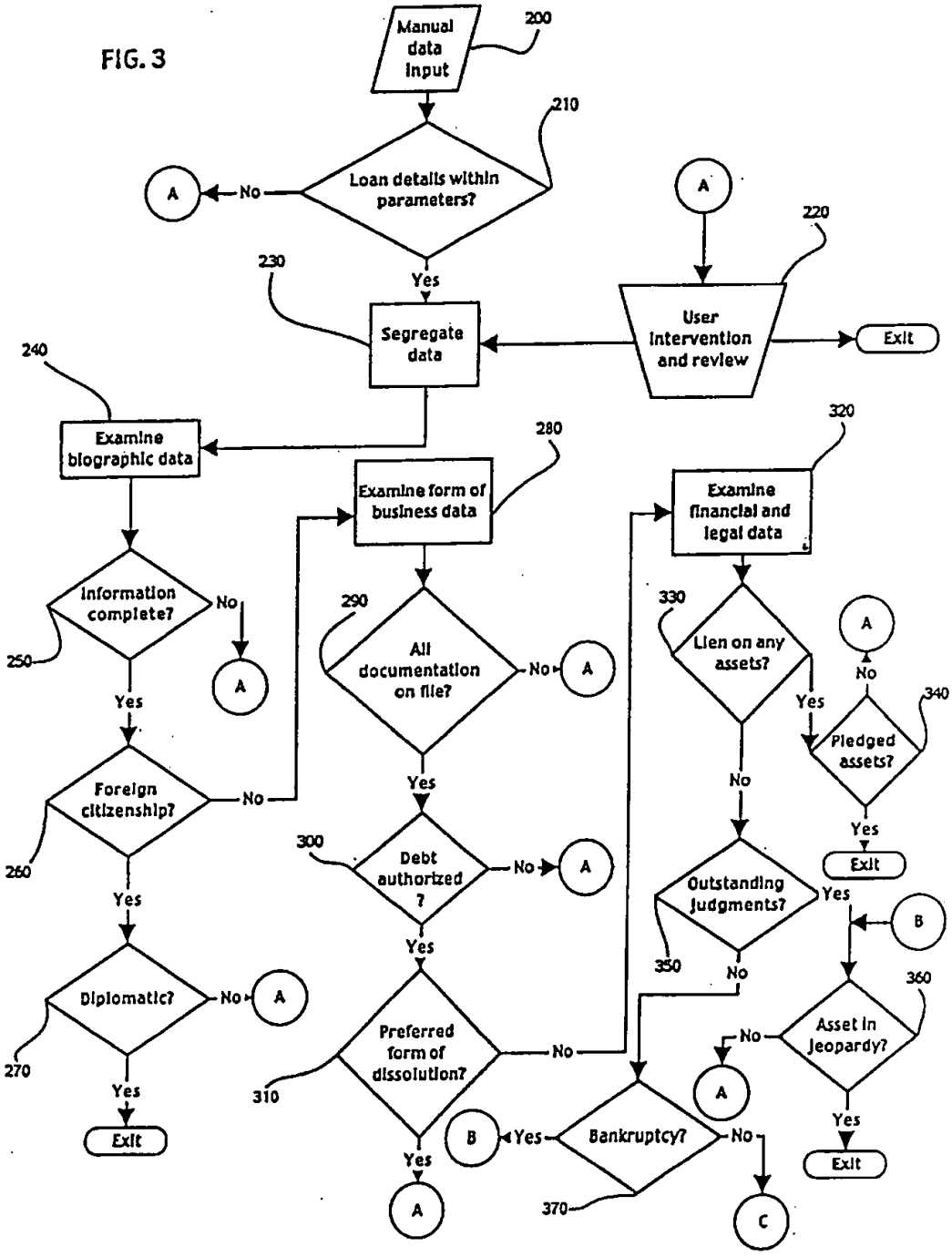

Manual data input
200
Loan details within parameters?
210
No
A
Yes
User intervention and review
220
Exit
Segregate data
230
Examine biographic data
240
Information complete?
250
Foreign citizenship?
260
Diplomatic?
270
Exit
Examine form of business data
280
All documentation on file?
290
Debt authorized ?
300
Preferred form of dissolution?
310
Examine financial and legal data
320
Lien on any assets?
330
Pledged assets?
340
Outstanding judgments?
350
Asset in Jeopardy?
360
Bankruptcy?
370
B
C

FIG. 4

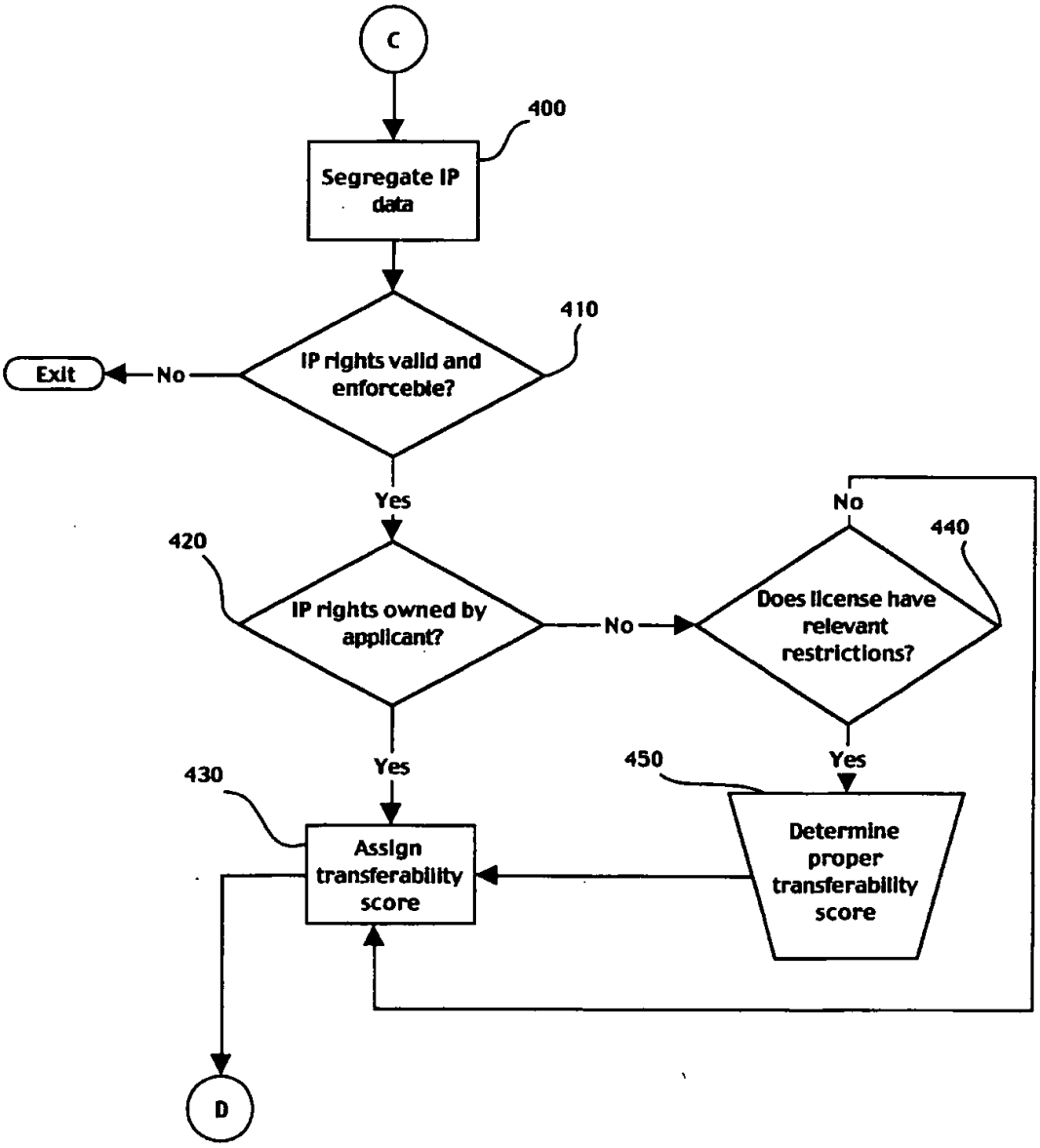

C
400
Segregate IP data
410
IP rights valid and enforceable?
Exit
No
Yes
420
IP rights owned by applicant?
No
440
Does license have relevant restrictions?
No
Yes
430
Assign transferability score
450
Determine proper transferability score
D

FIG. 5

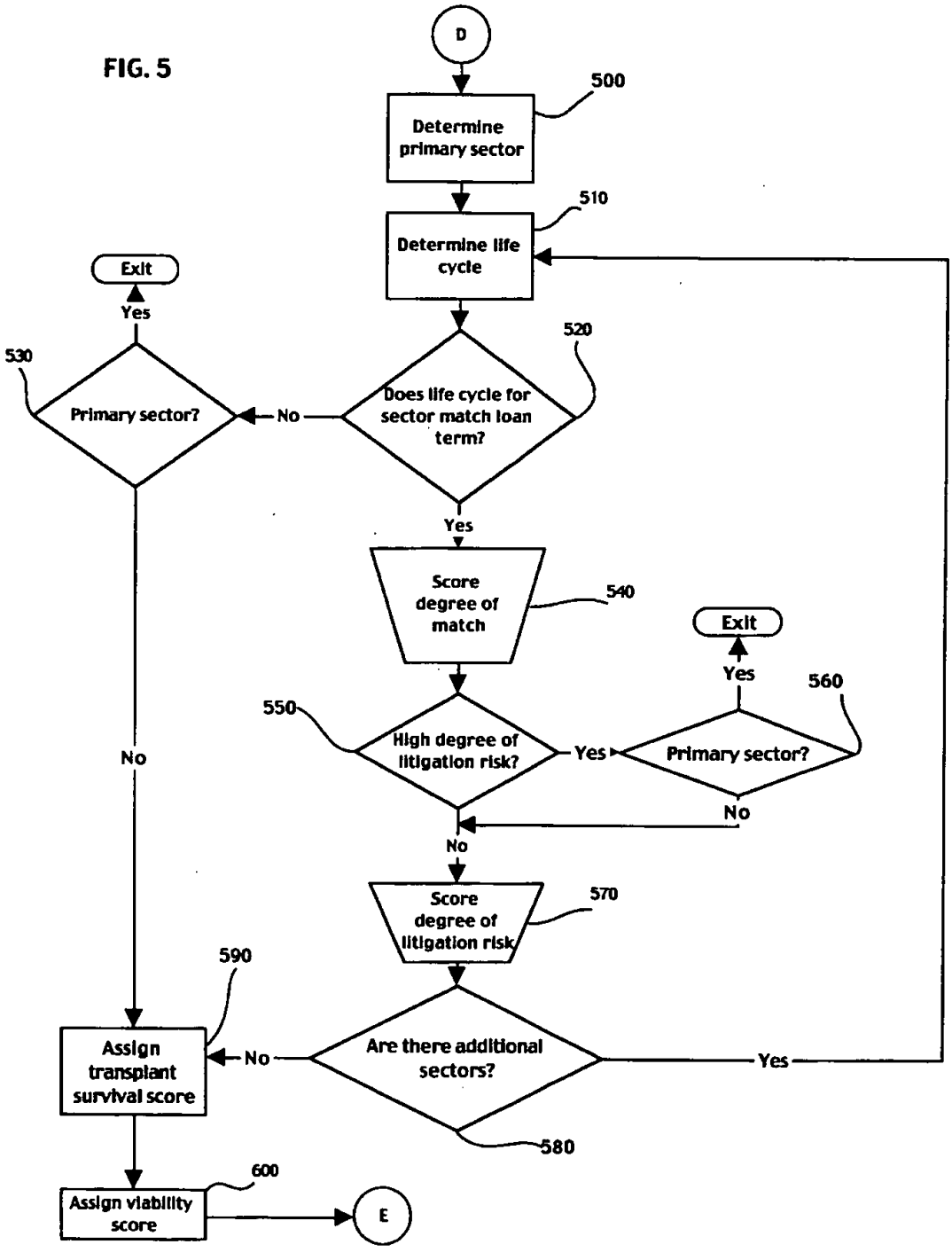
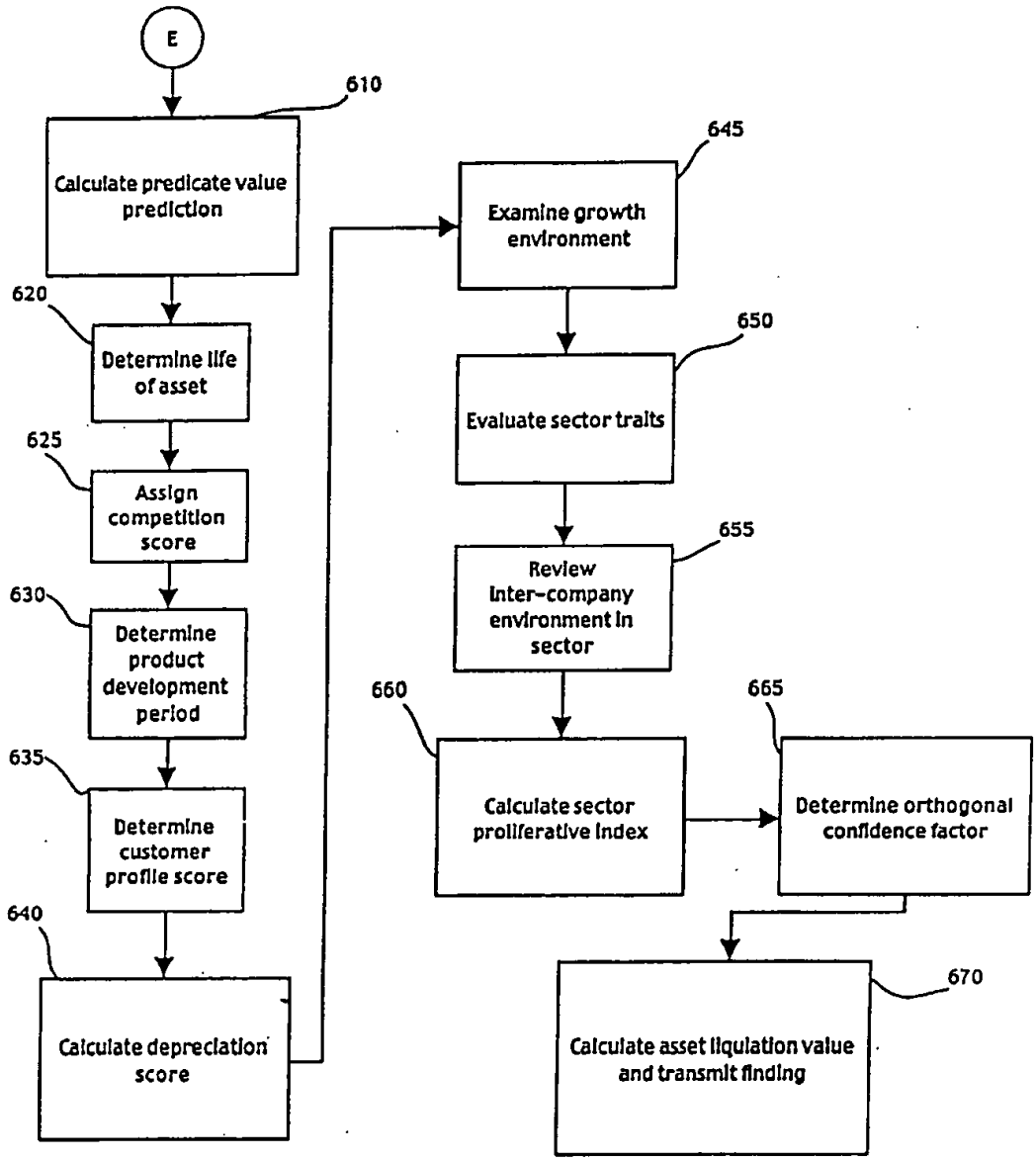

D
500
Determine primary sector
510
Determine life cycle
Exit
Yes
530
Primary sector?
No
520
Does life cycle for sector match loan term?
Yes
Score degree of match
540
Exit
Yes
560
550
High degree of litigation risk?
Yes
Primary sector?
No
No
Score degree of litigation risk
570
590
Assign transplant survival score
No
Are there additional sectors?
Yes
580
600
Assign viability score
E

FIG. 6


E
610
Calculate predicate value prediction
620
Determine life of asset
625
Assign competition score
630
Determine product development period
635
Determine customer profile score
640
Calculate depreciation score
645
Examine growth environment
650
Evaluate sector traits
655
Review inter-company environment in sector
660
Calculate sector proliferative index
665
Determine orthogonal confidence factor
670
Calculate asset liquidation value and transmit finding

METHOD AND APPARATUS FOR ESTABLISHING AND ENHANCING THE CREDITWORTHINESS OF INTELLECTUAL PROPERTY

TECHNICAL FIELD

The subject invention relates generally to a method for assessing and improving the creditworthiness of an asset and, more particularly, to a method for establishing a value for an intangible intellectual property asset such as a patent, a trademark or a copyright.

BACKGROUND OF THE INVENTION

Failure rates among emerging small businesses average between 70% and 80% within the first five years, with about half of those failures occurring within the first year. High tech businesses experience even higher rates of failure within the first three years of startup. Of all the reasons for these excessively high failure rates, the lack of access to adequate funds for initial capitalization, follow-on growth and business expansion is a primary factor. Historically, the lack of sufficient operating capital for cash needs has limited emerging companies expansion potential. A business failure in the world of high technology incrementally limits economic growth and means that valuable technologies and services may not ever reach the market. Drugs to treat diseases, telecommunications technologies to move greater amounts of data utilizing less bandwidth and new internet solutions can be stagnated or permanently paralyzed due to the inability to develop the business at the right time. Estimates suggest that small business failures account for billions of dollars of losses in potential sales, jobs and tax revenues annually.

Conventional emerging company financing involves raising funds through various sources including friends and family, angel investors, venture capital and other equity investors. Integral to these approaches is the dilution of ownership of emerging companies by the very persons upon whom success or failure of the venture lies. Faced with the potential loss of control, as well as the economic reality that growth requires capital, many owners of emerging companies would prefer debt financing. However, accessing debt capital from conventional banks, as an emerging company, has several intrinsic problems including lack of negotiable collateral, limited business performance history of the debtor, offering of a product which is non-traditional, hence untested, and which may be directed to an undeveloped or as yet nonexistent market.

As a result, commercial banks have viewed the emerging company market, especially the high technology arena, as very risky and have avoided significant participation. Due to an increased interest in small business development on the national and regional level, this business segment has become one to which banks would like to provide services. Unfortunately, they are not well suited to develop debt-financing products for this market due to their inability to establish an asset value for intellectual property and to establish predictive models to provide adequate risk management analysis as well as the absence of both a basis for reviewing operational/management structures and a liquidation strategy in the event of a loan default.

Although computer-aided and standalone systems are known to have been used for general risk evaluation, risk allocation and risk transfer purposes, for example in the insurance, real estate and financing industries, they have not typically been employed to enable intellectual property to be used as loan collateral, to establish maximum values and amortization schedules for such assets or to examine their transferability or viability. Therefore, in order to provide broader access by emerging technology companies to traditional lending sources such as banks, there exists a need to value intellectual property both as to its financial worth and credit risk and to make such loans as attractive as possible to lenders.

SUMMARY OF THE INVENTION

The present invention relates to a computer-assisted method and system for ascertaining and enhancing the creditworthiness of and establishing a value for intellectual property assets used as collateral for loans made primarily to emerging companies. When a lender is approached by an applicant seeking to use one or more forms of intellectual property (IP) as collateral for a loan, the lender typically has no way to assess the transferability, viability and value of the proposed collateral or to evaluate its creditworthiness or the risk associated with making such a loan. The process of this invention establishes a way not only to evaluate IP collateral risk but also to enhance the creditworthiness of the loan application to a lender by producing a collateral purchase price which may be used by a third party acting as a surety for the borrower. The third party contracts with the lender to purchase the IP collateral from the lender at a fixed price in the event that the applicant defaults on the loan and the lender is forced to repossess the IP collateral. This arrangement enhances the creditworthiness of the applicant by reducing the risk to the lender through provision of a known minimum recovery amount in the event the applicant fails to meet its loan repayment obligations or otherwise fails to abide by lending covenants.

The method of this invention is divided basically into two stages. The first stage involves validation of basic information about the applicant and the proposed collateral, such as ownership, transferability and viability. Unsatisfactory information provided in the first stage may result in either outright rejection of the collateral or intervention at various points by a system user to determine whether the particular information warrants rejection allowing for an override in the event that it does not. In any case of rejection, the applicant is informed of the fact of and reasons for the rejection. In some instances thereafter, remedial action may be possible by the applicant leading to resubmittal and reexamination of the collateral followed by eventual acceptance. The second stage involves the calculation of an asset liquidation value, also referred to as a purchase price, for the loan collateral. Determination of the asset liquidation value requires not only an examination of historical data but also demands an evaluation of prospective product, competitive and market projections based on market research, user experience, statistical data developed through use of the present invention and use of heuristic rules. Where there is insufficient historical or statistical data available, estimates based on the user's experience are used until adequate experiential data has been developed and stored in databases available to the computer system implementing the preferred embodiment of the invention. Once calculated, in the preferred embodiment the asset liquidation value is communicated to a third party which is to act as a surety for the loan. The third party provides a guarantee to the lender that, in the event of a default by the applicant, it will pay to the lender an amount equal to the liquidation value adjusted downward over time according to a depreciation schedule. Due to the mixture of historical and prospective analyses which occurs in the method of this invention, the asset liquidation value

may be an amount less than, equal to or even greater than the loan amount. This surety aspect of the present invention enhances the creditworthiness of intellectual property when used as collateral for a loan.

It is a primary objective of this invention to enhance the creditworthiness of intellectual property when used as collateral for a loan.

An additional objective of this invention is to provide a method for calculating a liquidation value for specific intellectual property used as collateral for a loan based on analyses of historical and prospective market and competitive factors derived from research, user experience, statistical data and the application of heuristic rules.

It is a further objective of this invention to provide a method for determining whether specific intellectual property is suitable and available for use as collateral for a loan.

It is still another objective of this invention to provide a method for assigning a customized purchase price and correlated depreciation schedule to specific intellectual property assets using retrospective, concurrent and prospective industry, product and sector data.

It is yet a further objective of this invention to ascertain whether the structural, financial or legal status of an applicant directly or potentially interferes with the use of specific intellectual property as collateral for a loan.

It is another objective of this invention to determine whether specific intellectual property may be readily transferred in the event of a loan default by an applicant.

A further objective of this invention is to provide a method for ascertaining the viability of specific intellectual property by first analyzing the life cycle of that property through an examination of both the primary known market for the intellectual property product as well as secondary markets for the property, some of which secondary markets may as yet be undiscovered or unobvious and then determining the degree of reliance which the applicant and the market have on key personnel and suppliers.

Still another objective of this invention is to provide a method of redundant evaluation of the transferability of products derived from intellectual property during the life cycle of a loan using that intellectual property as collateral.

Yet another objective of this invention is to provide a method for systematic liquidation of assets used as collateral for a loan in the event of a default in payment of that loan.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other objects, aspects and advantages of the invention will be better understood from the following detailed description of the invention with reference to the drawings, in which:

FIG. **1** is an overview in block form of the process of this invention;

FIG. **2** is a block diagram of a hardware system for carrying out the data processing and operational methodology according to the preferred embodiment of the present invention;

FIG. **3** is a program flowchart depicting the data processing, storage and operational steps of the first substage of the first stage of the invention;

FIG. **4** is a program flowchart depicting the data processing, storage and operational steps of the second substage of the first stage of the invention;

FIG. **5** is a program flowchart depicting the data processing, storage and operational steps of the third substage of the first stage of the invention; and

FIG. **6** is a process flowchart depicting in greater detail the data processing, storage and operational steps of the second stage of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT OF THE INVENTION

For a better understanding of the invention, reference is now made to FIG. **1** of the drawings. This figure presents an overview in block form of the process of this invention in which basic information concerning the biographic, legal and financial status of an applicant is first validated, as indicated in block **5**. Then, as shown in blocks **10** and **15** respectively, the degree of transferability of an intellectual property (IP) asset is established as is its viability by scoring each of these factors. After additionally establishing a predicate value prediction, a depreciation linearity slope factor, sector proliferative index and orthogonal confidence factor, at boxes **20**, **25**, **30** and **35** respectively, all of this data is mathematically combined according to a formula described below to produce an asset liquidation value (or purchase price) at block **40** which is communicated to the lender along with a report detailing the various scores and the particular factors which are susceptible to improvement or change by the applicant. Each of these steps is explained in greater detail below.

The process of this invention is preferably performed by use of a computer system cooperating with one or more users who supervise and may intervene and at times override conclusions reached by the computer system, although the process may also be performed manually. A block form overview of the computer system of a preferred embodiment of the instant invention is shown in FIG. **2**. This system may be implemented in the framework of a cooperative computer support network in which users initiate certain actions and make final decisions using information that has been partially computer-processed. The various components of the system are interconnected to each other via a supervisory central processing unit (CPU) **45** which may be any type of digital or other computing apparatus, such as a main frame or mini-computer. Supervisory CPU **45** coordinates, organizes and relays information to and from other components of the system. For each new applicant, the user may manually enter all data available for performing the calculations of this invention as relate to that applicant at user CPU **50** to which are connected one or more display devices **55**, such as a CRT, and one or more devices for producing hardcopy documents, such as a printer **60**. This information typically includes general applicant identifying data as well as legal, structural and financial data specific to the applicant and the applicant's industry and markets. Alternatively, data may be entered in an automated fashion by using a scanning device or may be collected from a secure Internet website based on entries made directly by the applicant. Certain types of relevant data, such as patent and trademark status and market-specific information arranged by standard industry code, may be stored on databases or Internet websites external to the computer system of this invention, and the system may also be configured to include facilities for automatically or manually accessing such external databases to retrieve required information. Initially, the entered data is stored in one or more databases for access and use throughout the process of the invention by any component of the system, as required, in online storage device **65** which may also be in the form of offline storage or a combination of on- and offline devices. Storage device **65** also stores system information in database form related to industry and market data for many different products and product types, credit

scores and statistical and historical data as will be explained below. Expert system CPU **70** and scoring system CPU **75**, both of which communicate with supervisory CPU **45** comprise the automated support components of the system. Expert system **70** may be a separate computer CPU operating with heuristic rules for solving related problems based on information supplied to it by supervisory CPU **45** which, in turn, was derived from other components of the system. The expert system performs data management and actuarial modeling of historical and prospective events which may impact the value assigned to the IP asset. Scoring system **75** may be another separate computer CPU which makes use of statistical models to build a score function based on associated quantitative input attributes in order to objectively evaluate the creditworthiness of an individual applicant. By using this structure of automated components, subjective decision making is minimized in the asset evaluation process, conclusions are standardized and, consistent for a given set of information, user learning time is reduced, quick resolutions of asset queries may be obtained and data tractability is provided. Critiquing system CPU **80** compares the reasoning of the user, who may be an asset evaluation officer, as entered at user CPU **50** with computer results generated in the expert and scoring components of the system and notifies the user through supervisory CPU **45** if it detects a reasoning error. The user may then perform evaluation or re-evaluation tasks him/herself using the information or feedback filtered and refined by supervisory CPU **45**. Results and interim system communications may be displayed on device **55** and/or reproduced on printer **60**. The computer system may alternatively assume multiple configurations such that, for example, one or more CPU's singly or jointly perform all of the functions described above and multiple users may be simultaneously accommodated. A feedback loop and/or artificial intelligence constructs are contemplated for use with the process based on a comparison of actual outcomes and predictive outcomes derived from the scores and heuristic rules assigned by the process so that the computer system may train itself over time to assume more and more of the functions initially requiring user intervention and to do so with an increasing level of accuracy, sensitivity and specificity.

Implementation of the system and method of this invention is basically a two stage process. In the first stage, a determination is made whether or not the intellectual property under consideration is qualified, transferable and viable. In the second stage, a value is placed on that asset.

The first stage of the process is comprised of three substages. In the first such substage detailed analyses of the organizational, legal and financial structure of the applicant and its collateral are made in order to determine whether it qualifies for asset analysis in subsequent substages. Thus, the end result of the first substage is a decision indicating whether to cease asset processing, to proceed with asset evaluation pending adjustments made to address deficiencies detected in the substage, or to proceed with IP value assessment. In order to qualify, an applicant must be shown to be legally and financially healthy. For an understanding of the first substage, reference is made to FIG. **3** which illustrates the analytical process in flowchart form. At step **200**, a large variety of data is entered into user CPU **50** which has been or should have been collected from the applicant and/or other sources. The data may be answers to questionnaires prepared by the user in advance, direct input of documents containing the information, data retrieved from sources external to the system or a mixture of all methods. This data provides a detailed picture of the identity and financial and legal status of the applicant and is added to the data storage facilities **65** of the system. A preliminary screening is performed at block **210** to determine if the loan term, amount, purpose, requested term, type of collateral offered and projected source of repayment are within the parameters preset for the system. If not, processing is referred for user review and intervention at block **220**. Throughout the first substage, when human intervention is required a decision is being made whether the problem referred for review is remediable or not. Whatever steps are required to remedy a problem must have been acceptably completed before the process is permitted to continue beyond block **220**. At this first referral to block **220**, a determination is made whether circumstances particular to the asset evaluation application nevertheless warrant overriding the system's preliminary filter-based rejection of the collateral. If not, the process exits the system. Upon exiting the system, the process is stopped and the applicant is notified of the reason for rejection of the collateral. In some cases remedial action can be undertaken by the applicant leading to eventual resubmission, reexamination and approval of the IP as collateral. If an override is appropriate, a reason for the override must be entered into the system and a bypass flag is set. Whenever a user makes an entry at block **20**, the system automatically includes a revision identity code with the entry to identify when and by whom an entry has been made. This revision code may be encrypted and/or limited access may be provided to such entry information to protect against system errors or fraud. Thereafter, processing continues at block **230** where supervisory CPU **45** accesses the data and segregates it into three types of information for separate processing. At block **240** the first type of data, which is biographic, is examined. This biographic data includes information such as the applicant's physical and virtual (Internet) names, address(es) and telephone number (s), along with its standard industry code (SIC), tax identification numbers and detailed information concerning the experience, ownership interest and longevity of its management team. If the data is not found to be complete at block **250**, processing is referred to block **220** for user review and intervention. If the data is complete, processing proceeds to determine at block **260** if the applicant has foreign citizenship, i.e. that applicant is organized under the laws of a foreign country. If the applicant does have foreign citizenship, processing is referred to block **270** to determine if the applicant has diplomatic status. If there is diplomatic status, the system rejects the asset outright due to the virtual impossibility of enforcing contract agreements against diplomatic personnel and exits. If there is no diplomatic status, processing is referred to block **220** for user review and intervention. Since jurisdictional questions and foreign laws can greatly complicate collection of debts owed by foreign nationals, a decision must be made whether the asset evaluation application warrants further processing. If not, the system is exited. If so, a bypass flag is set and processing continues at block **280** where data relating to the structure and form of business of the applicant is examined to determine, for example, what type of business structure the applicant employs. The manually entered data is initially examined at block **290** to verify that all data and supporting proof has been received as part of the asset evaluation application. This data includes such information as the number of employees in the business, the date of incorporation or initiation of business transactions and proof of business status. Asset evaluations through the process of this invention are intended to be made available only to business entities, not to individuals. Thus, documentation supporting

the applicant's business status as, for example, a type of corporation, partnership or sole proprietorship is required, along with such supporting papers as articles of incorporation, bylaws, partnership or shareholder agreements and any outstanding contracts or agreements purporting to regulate assumptions of debt or equity and dissolution of the business entity. Manual and/or automated data entries confirm receipt of that documentation for each type of business entity. If any documentation is absent, processing is transferred to block **220** for user review and intervention. Either the missing documentation is supplied and a flag is set to authorize continued processing at block **300** or the system is exited. At block **300**, a decision must be made whether the submitted documentation explicitly or implicitly authorize assumption of debt by the applicant. This decision may require human intervention and review if authorization is unclear. For such intervention, processing is referred to block **220**. If authorization is clarified, a bypass flag is set and processing continues at block **310**. Otherwise, the system is exited. At block **310**, supporting documentation concerning business structure is reviewed to ascertain if there is a preferred form of dissolution or if there are any restrictions on dissolution. If there are or if the answer is unclear, processing is referred to block **220** for human intervention and review of this issue. If disadvantageous restrictions on dissolution exist, a waiver of rights or claims must be obtained to allow an asset to convey to the lender despite the dissolution provisions. Otherwise, processing continues at block **320** where data relating to the financial and legal status of the applicant are examined to ascertain if there are encumbrances on the asset to be used as loan collateral. At block **330** a determination is made whether there are any liens on any assets of the applicant. If there are such liens, a determination is made at block **340** whether the lien is on the intellectual property asset which is intended to be pledged as collateral for the proposed loan and, if so, the process is exited and the asset evaluation application is rejected. If the lien is on another asset of the applicant, processing is transferred to block **220** for human intervention and review. If upon review the lien is found not to interfere with the security of the proposed IP collateral transaction, a bypass flag is set and processing continues at block **350**. Otherwise, collateral viability and transferability are determined to be inadequate and the process is exited. A similar review of legal judgments against the applicant is performed at block **350**. If one or more such judgments exist, processing continues at block **360** where a decision is made whether the judgment(s) places the intellectual property asset which is intended to securitize the loan in direct jeopardy. If so, the collateral viability and transferability are determined to be inadequate and the process is exited. If not, processing is transferred to block **220** where a determination is made whether the judgment constitutes a sufficient auxiliary threat to the security of the asset to warrant rejection. If so, the process is exited and, if not, a bypass flag is set and processing continues at block **370**. At this block, a review is made of the financial history of the applicant to see if it has a history of bankruptcy or unsatisfied judgments outstanding against it. If so, processing is transferred to block **360** where a decision is made whether the bankruptcy places the intellectual property asset which is intended to securitize the loan in direct jeopardy. If so, the collateral viability is judged to be inadequate, and the process is exited. If not, processing is transferred to block **220** where a determination is made whether the degree of collateral threat to the proposed pledged asset is assessed and whether the threat is remediable. If the threat is determined to be sufficiently great, the collateral viability is judged to be inadequate, and the process is exited. Otherwise, remedial action is taken as necessary and a bypass flag is set indicating that the analysis performed in the first substage of the first stage is deemed completed and processing may progress to a specific analysis of the intellectual property asset proposed as collateral for the loan.

FIG. **4** illustrates a program flowchart of the analytical process of the second substage of the first stage. Processing performed in this second substage is designed to produce a transferability score. This score may either be a binary decision indicating a positive or negative decision on transferability or may be a score ranging from 0 to 100 indicating a degree of transferability. In the case of a numerical score, any score above 50 indicates that the intellectual property is likely to be transferable. Conversely, a score below 50 means that the asset is not a good candidate for transfer. The transferability score is useful not only because it indicates the facility of transfer of an asset but it may also be used as a weighting factor in calculating the sector proliferative index which is discussed with regard to blocks **645** through **660** below. At block **400**, CPU **45** segregates certain parts of the data manually entered by the user at block **200**. This data relates to the type of intellectual property sought to be used by an applicant as collateral. Thus, for example, information relating to (1) patents issued and applied for and their current status, (2) trademarks, service marks and Internet domain names applied for and registered and their current status, (3) copyrights applied for and their current status and (4) trade secrets is segregated by supervisory CPU **45** for review. It is contemplated that the method of this invention could also be applied to new types of intellectual property yet to be developed as well as to other non-traditional, intangible assets. At block **410**, a determination is made whether the intellectual property rights are active and enforceable. This requires a review of information such as whether patent and trademark fees have been timely paid, whether a payment due date is imminent and whether the intellectual property rights have been abandoned due to failure to pay fees, lack of use or for another reason, all of which is information which was entered at block **200** in FIG. **3**. If the intellectual property rights are found not to be active and enforceable, the process is exited. If those rights are active and enforceable, at block **420**, a determination is made whether the intellectual property is owned by the applicant. If so, the asset is assigned a transferability score of **100** in block **430**. A separate asset maintenance program which is incorporated into the loan covenants assures that the value of the IP asset is not lost during the life of the loan due to failure to pay required fees to government agencies or others or to take other steps necessary for keeping IP rights active and enforceable. If ownership does not lie with the applicant, processing continues from block **420** to block **440** where the terms of the license are reviewed. First, a decision is made whether either the terms of or restrictions contained in the license specifically or potentially eliminate or reduce the value of the intellectual property under review. If there are no such restrictive terms, a flag is set such that a transferability score of 100 is assigned in block **430**. However, if there are such restrictions, user intervention is required at block **450** to determine the appropriate transferability score to assign to the asset. For example, it is possible that a license may contain terms calling for a termination of the license if intellectual property is not commercialized by the licensee or certain performance criteria are not achieved by the licensee within a certain period of time. After reviewing the loan term requested, data which was entered at block **200**

of FIG. 2, the user determines the degree to which that loan term affects the transferability of the asset. Thus, the greater the likelihood that a restrictive term in a licensing agreement would call for imminent termination of license rights, the lower the transferability score that would be assigned to the asset. The score is, therefore, inversely proportional to the length of time until termination of the licensing rights. The score determined by the user is then assigned at block **430**. This score has added significance in determining the liquidation value of the asset as discussed below in relationship to FIG. **6**. Processing then progresses to the third substage.

In FIG. **5** a program flowchart of the analytical process of the third substage of the first stage is shown. Processing in this third substage is aimed at establishing a viability score for the asset. This score may be binary, numeric, ranging from 0 to 100, or may be a multi-layered score (such as excellent, good, fair, poor) and represents a subjective assessment of how likely the asset is to be successfully marketed. At block **500**, the process requires that the primary market sector of the asset be identified. For example, if the asset were a catheter, its primary sector might be for use in a specific medical procedure. Then, at block **510**, a determination is made based on research of comparable products concerning the projected life cycle of the asset in its primary sector. This function may initially be performed by users but, based on information developed through experience over time, may also be completed by a computer expert system **70** using information stored in a database and relevant heuristic rules. If the length and terms of the loan sought by the applicant do not match the life cycle of the asset, as determined at block **520**, and this conclusion results from a consideration of the primary sector for the asset, as determined at block **530**, the process is exited and the asset evaluation application is rejected since the risk of default would clearly not warrant making an offer to purchase the asset. An example would be an application specifying a term of 10 years when comparable products have had a life cycle of only 2 years. On the other hand, if there is a match, the degree of that match is scored at block **540**. Although this determination is subjective, it is based initially on research and eventually on stored historical data. For example, if comparable assets have had a 10 year life cycle but the loan term sought is only 5 years, a high life cycle score will be assigned to the asset. At a minimum, the life cycle of comparable products in this sector must be no less than the term of the loan sought. The process then calls for an examination at block **550** of the level of litigation risk associated with the asset in its sector. Litigation risk would result from an asset to be marketed in a highly competitive sector where there has been a history of litigation between competitors based on allegations such as patent, trademark or copyright infringement. Other litigation risk could arise from product or process liability inherent to a product type or sector. If there is high litigation risk involving the primary sector for an asset, as determined at block **560**, the process is exited since the exposure to litigation decreases the viability and value of the asset. Evaluation of litigation risk is based on empirical data which will be updated in an ongoing basis over time with information derived from publicly available databases. Otherwise, the litigation risk for the primary sector is assigned a score at block **570**. The next step in the process, performed at block **580**, is very important. It requires research into all aspects of the asset to determine if that asset has one or more other potential applications in market sectors other than those initially considered its primary market sector. Continuing the catheter example from above, suppose that analysis of the catheter indicates that since it is made from plastic it has potential use in magnetic resonance image technology. Then, the same analysis as was performed for the primary sector is repeated, beginning at block **510**, as many times as necessary to obtain life cycle match and litigation risk scores for each of the additional market sectors which are believed to be applicable to the asset. Once reviews and scoring have occurred for all of the additional sectors, if any, the process continues at block **590** where an assessment is made of the vigor and independence of the asset. This is accomplished by analyzing the degree of reliance which the applicant and the market has on key personnel and suppliers. Dependent on this analysis, a transplant survival score is assigned to the asset. In the preferred embodiment, scores range from 0 to 100 although other scoring scales, including binary and layered scoring, may be used. A low transplant survival score indicates that the applicant is excessively reliant on key personnel or suppliers. Since the factors which influence the transplant survival score may be within the control of the applicant, actions may sometimes be taken by the applicant to ameliorate problems in these areas and to raise this score. The life cycle, litigation risk and transplant survival scores are all aggregated at block **600** in order that expert system CPU **75** can produce a viability score for the asset(s) under review and their position in the marketplace. This viability score is based on a sum of the weighted average of numeric representations of the life cycle, litigation risk and transplant survival scores. The exact weighting assigned to each factor is elective and may vary over time depending on experience with the impact which each factor ultimately has on viability.

In the second stage of the process, a purchase price, also referred to as a liquidation value, for the asset(s) being used as collateral is calculated. This price is dependent on five factors: a predicate value prediction for the asset, a slope-based expression of depreciation linearity, a sector proliferative index, an orthogonal confidence factor and a variable profit factor. FIG. **6** illustrates the steps which are undertaken to determine and apply these factors. At this stage, a decision has been made that the intellectual property asset offered by the applicant as collateral for a loan meets the minimum level of transferability and viability to warrant establishment of a liquidation value for the proposed collateral. From this point forward, the process does not contemplate any exit points until such a liquidation value has been established. The process first requires that research be performed to locate and value comparable, or predicate, properties, such as purchases, sales and investments in comparable products or services. At least two such predicate values (PV) must be found to enable the process of this invention to be applied. One such predicate value may, for example, be represented by the direct investment made by the loan applicant in the asset serving as collateral. It is important to note that PV's are non-equity based, cash only values when such cash values are known. Only when no cash values are known will consideration be given to equity values and then such equity values will have to be adjusted to reflect the fact that they often do not represent accurate present values. At block **610**, the mean PV is then calculated and multiplied by the coefficient of variation of the distribution of the predicate values found to produce a predicate value prediction (PVP). This use of the coefficient of variation enables a moderating control to be exerted over the reliability of the mean PV.

Next, a series of steps is used to ascertain depreciation linearity and the mathematical slope of that linearity. A linear slope of 1 would indicate a low order of depreciation

for an asset, meaning that it is unlikely that anything will happen over time to change the rate at which the IP asset is expected to depreciate. A nonlinear depreciation could indicate that a replacement product is expected on the market which would at some future date rapidly increase the depreciation rate for the IP asset. In the case of a nonlinear depreciation, a best fit analysis would be used to determine the slope of the depreciation linearity. The life of the intellectual property asset is determined at block **620**. This period represents the length of time during which the asset has value and is based in large part on a comparative analysis of the market in which the asset must compete. Factors such as the following may be considered in calculating this period: product life cycle, the existence and term of any governmental regulatory and/or trade barriers to sale of the product and the time which can be expected to pass before a generic or knock-off version of the product is likely to become available and accepted by customers. The longer the life of the asset, the lower the depreciation score will be. A competition score is derived at block **625**. The manner in which this score is determined is important since it takes account not only of historical known competition in the asset's market but also, through use of heuristic rules and experience data stored in databases, of the probability of prospective competition by corollary, perhaps as yet unknown, competitors. A high competition score leads to a higher depreciation score. The length of time necessary to develop the product and bring it to market is calculated at block **630**. This period depends on such factors as the degree of reliance on key suppliers and availability of raw materials, the uniqueness of the production process, training time necessary before production can commence and any special considerations applicable to the particular product. The longer it takes to develop a product, the higher its depreciation score. At block **635**, a customer profile score is determined. This score quantifies customer behavior in particular markets and requires examination of the number of potential customers for the product, the purchasing history of those customers, the degree to which the market is saturated for the type of product represented by the asset and the existence of barriers to distribution into the proposed market whether by agreement or otherwise. For example, if the market is comprised of a limited known number of customers whose purchase of products follow a known cycle, it is possible to predict with reasonable certainty the likelihood of acceptance and success for a new product introduced into that market. A low customer profile score translates into a high depreciation score. At block **640**, expert system CPU **70** aggregates information concerning the asset life, competition score, product development period and customer profile score to calculate depreciation linearity. This linearity is calculated through a dynamic statistical analysis where all retrospective data from historical archives and from previous assets considered in this process are used to model future depreciation models. This process can be described as dynamic depreciation discriminant analysis with continuous relevance adjustment. Thus, a best fit type analysis is used to obtain a depreciation line, the slope of which describes depreciation linearity. The viability score calculated at block **600** may optionally be expressed as a percentage and be used as a multiplier of the depreciation linearity slope since viability mediates the best fit depreciation line. A viability score of 100, therefore, would indicate that the full value of the slope of the depreciation linearity is proper to use in calculating the liquidation value of the asset.

The sector proliferative index (SPI) provides an indication of the ease with which an intellectual property asset may be sold, licensed, turned into a new company or aggregated with other similar assets in the event that an applicant defaults on a loan by providing information about the anatomy of growth within the asset's market sector, i.e. how growth within the sector occurs. This permits a clear projection to be made about the liquidity associated with the IP asset in the event of liquidation. Since industry proliferation does not occur in a linear continuum, but rather in a multi-dimensional continuum accounted for by the interplay of various factors, the SPI is an algebraic function described by a line or its representation. It is a descriptive that enables the user to make a probability statement concerning how an asset in a particular market sector is best disposed of, or liquidated, in the event that an applicant defaults on a loan. The goal of the SPI is to identify an asset which has a high likelihood of being an acquisition target. An asset with a high SPI would typically be held by a large, public company in a sector where growth occurs with little inter-company hostility and through acquisition of other products or companies rather than through independent innovative development. The first component of the SPI involves a consideration at block **645** of how growth in the particular sector occurs. This requires information concerning not only the number and size of companies in the industry sector showing whether the sector is basically expanding or contracting and at what rate but also of the manner in which growth occurs. For example, information may be developed independently from the system by research and/or retrieved from databases such as those maintained in online storage device **65**, as necessary, to indicate whether companies in the sector typically grow by acquiring other companies or by developing new technology, the extent to which growth is accounted for by the emergence of new start-up or spin-off companies, and whether there is a propensity in the sector for growth to result from the development of corollary businesses, meaning businesses not in present, direct, immediate competition with the applicant or with the market sector at which the asset is primarily targeted. If the sector is growing and doing so through acquisition of companies, a higher SPI is warranted. Secondly, an examination of sector traits occurs at block **650**. Information may be developed independently from the system by research and/or retrieved from databases such as those maintained in online storage device **65**, as necessary, concerning whether businesses in the sector typically integrate research and development with manufacturing into a single unit and whether such businesses are largely public or private. If the sector is comprised primarily of non-integrated, public businesses, a higher SPI is indicated. Finally, at block **655**, information is examined concerning the intercompany environment within the sector which illustrates the rationale or reasons for which growth occurs in the sector. Again, data may be developed independently from the system by research and/or retrieved from databases such as those maintained in online storage device **65**, as necessary, to show the level of cooperation between entities within the sector. If companies within the sector exhibit a high degree of hostility, shown by a high level of litigation, alleged intellectual property infringement activity and corporate raiding activity whether directed at personnel or companies themselves, a lower purchase value is warranted since growth in the sector may not be occurring due to innovation but rather as a result of strategic repositioning of companies vis-a-vis each other. The three foregoing factors are aggregated at block **660** by supervisory CPU **45** to arrive at an SPI. Initially, the SPI will be binary, either 0.01 or 1, wherein 0.01 equals a certain business start-up model and 1 equals a certain cash liquidation model.

As experience permits finer distinctions to be made, it is anticipated both that the SPI may also be represented by a number between 0.01 and 1 and that the transferability score may also be used as a weighting factor in determining the SPI.

The final component required to produce an asset liquidation value is a probability number representing the orthogonal confidence factor (OCF). This index is determined at block **665** and reflects the likelihood that an asset under consideration for use as collateral will have utility in specific, identified markets other than those towards which it is initially targeted. Thus, the OCF is a numeric multiplier which assesses the degree to which changes in at least one other sector may positively impact the value of the asset under review. In the preferred embodiment, the OCF reflects analyses of at least three sectors. For example, if one were to have a high capacity electric battery which could power automobiles and the automotive industry decided to build 40% of all cars to run on electricity, the impact to the battery technology could be significantly improved. If, however, no one ever built electric cars, the value could be minimal or could be none at all. Aspirin provides a real life example of the OCF concept. Initially, aspirin was used primarily to reduce fever and inflammation. It initially enjoyed considerable market success and went through various product iterations and variations as generics became available. However, sales stagnated until it was determined that aspirin also reduced the severity of heart attacks. Thereafter, the sales of aspirin products were rejuvenated due to the discovery of a new market for the known product. OCF attempts to identify how many and which parallel and corollary markets may exist prospectively for any particular IP asset. Different markets have different but relatively consistent incidents of such ancillary developments. The reason the term orthogonal is used to describe this index is that the aim is to identify presently unknown markets which are theoretically perpendicular to and exist outside of the primary plane for the primary market for the asset. The OCF assumes that there are very few developments which are truly creative and novel. Instead, most new markets arise out of unrecognized applications or needs related to known products. The OCF represents the confidence level with which one can conclude, first, that market expansion opportunities for a particular asset or for something derived from the asset are not based solely on that product's life cycle but are also based on other, orthogonal opportunities existing in other market planes and, second, that those orthogonal opportunities can be captured and exploited. OCF is based on disciplined basic research into source documentation relating to the basic industry and scientific literature relating to the market field of the asset attempting to understand how the field is developing and how those developments might relate to and impact the asset. Similar to the depreciation linearity model discussed above, OCF is calculated using dynamic discriminant analysis with continuous relevance adjustment applied to retrospective and prospective orthogonal data. In the preferred embodiment, a single OCF is calculated from consideration of a minimum of three orthogonal industry comparisons. Although it is initially an estimate based on research performed by hand, experience will permit a standard metric to be developed for various industry sectors so that the confidence level prediction becomes more accurate and reliable. As a result, the assignment of an OCF may ultimately be tasked to a computer system such as expert system **70** and scoring system **75**. Thus, a high OCF means something has been identified which is fairly imminent and which will result in an additive or exponential effect on the collateral's marketability.

In order to obtain an asset liquidation value at block **670**, the following formula is applied:

Asset liquidation value=(PVP*slope of depreciation*SPI*OCF)*k where k represents a profit constant. For example, if a profit of 20% were desired,

$$k=(1-0.2)=0.8$$

Calculation of the liquidation value may be performed either manually or by supervisory CPU **45** and is then transmitted in a report to a third party who undertakes to act as a surety for the loan applicant. In the alternative, should there be no surety, the report may be communicated directly to a lender. The report to the lender may include or omit the particular scores and indices as preferred by the user.

The asset liquidation value may be the same as, lower than or even higher than the loan amount sought by the applicant. These different possibilities reflect the interplay of the elements considered in assigning the asset liquidation value at block **670**. Once the initial asset liquidation value has been determined, a depreciation schedule is prepared for the asset showing a decreasing value over the life of the loan which it collateralizes. This depreciation schedule does not necessarily reflect the effect of reductions in principal resulting from periodic repayment. Rather, it is based on judgments made by the surety of the value which the loan collateral will have to it over the term of the loan. The third party surety typically agrees with the lender that it ill pay the lender a fixed amount indicated by the depreciation schedule in the event that the loan applicant defaults on the loan in return for transfer to it of the collateral, although variations on this arrangement are also possible. The mere willingness of a third party to act as a surety greatly enhances the creditworthiness of the applicant. Even more unique is the possibility that the payment guaranteed by the surety may be equal to or even higher than the initial loan amount reflecting the prospective nature of the analysis undertaken through the disclosed method.

The following hypothetical example is provided to illustrate the method and utility of this invention. LABORATORY Inc. of Arizona has 9 issued patents which cover a proprietary method of analyzing liquid for oils present in suspension. The patent portfolio includes 3 reagent composition of matter patents, 3 production method patents and 3 use patents. In addition LABORATORY Inc. has licensed 18 patents from universities and laboratories which are used for product extensions. LABORATORY Inc. approached a lender seeking access to $800,000 in debt financing for product rollout. Their intent was to repay the loan in 48 months.

LABORATORY Inc. completed a loan application and submitted the required documentation and fee to the lender which, in turn, passed all material received on to a third party surety for analysis. An analyst for the surety assigned the application a code number and enters all application information into user CPU **50** for standardized data management and analysis.

The first stage of the analysis is designed to establish the transferability and viability of the patent assets sought to be used as security for the loan. All 9 patents issued to LABORATORY Inc. are owned by LABORATORY Inc. Based on the analysis, the first patent which will cease to have resale value for the surety will mature in 2010. There are no limitations in the corporate documents which would prohibit the use of the patents for collateral. There are no outstanding judgments or claims against the company. Copies of the patents and review of related patents reveal no reasonable assumption of infringement. Upon review, there

are no personal or corporate compromises on this asset which would negatively impact its use as collateral. There are no license fees or reversion claims associated with these assets. All requisite fees have been paid to date. The transferability score is therefore 100.

Regarding viability, review of the primary and secondary sectors indicate that the product life cycle has been shown in 3 comparable cases to exceed 84 months. These three cases are BDX, RWJ and ABT. The loan request is for a 48 month term, resulting in a life cycle to term ratio score of 75 where 0=1:1 and 100=2:1. In the past 3 years, there has been no intellectual property litigation in the primary sector resulting in a litigation risk score of 100. The secondary sector data is equivalent. Since the final litigation risk score is determined by pooling and averaging the litigation risk scores in the various sectors considered, the final litigation risk score is also 100. The transplant survival score is 100 based on the fact that there is nothing about the intellectual property which requires non-disclosed know-how and there is a history of similar assets being sold outright or through license agreements. The aggregate viability score is the average of the sum of the scores and index given above where 0–29=no viability, 30–50=marginal viability, >50= acceptable viability. In this case, the viability score is 91.66 or (75+100+100)/3.

The second stage of the analysis is designed to establish a liquidation value for the intellectual property assets which in this case are all patents. Initially, a review of sales of comparable assets is undertaken which may reflect on the value of the asset sought to be used as collateral in order to establish a predicate value. If none exist, extrapolative comparable or predicate values are calculated based on aggregate sector licenses in primary or secondary sectors deemed to be relevant. In this case, there are three predicate values. First, in 1997 RWJ entered into a license with Dynamics Analysis for a product in an analog market. The terms of the license of the three patents held by Dynamics Analysis were $500,000 upon signing and 1.5% royalty on gross sales for 13 years. The agreement called for minimum annual sales by RWJ of $2.5 million with an associated minimum aggregate annual fee of $487,500 for the life of the licenses. In 1998, RWJ had $7.8 million in sales and had paid Dynamics Analysis $117,000 in the first year of sales. RWJ projects 20% sales growth for the next 5 years. The resulting projected 5-year return to Dynamics Analysis is $870,600. The predicate value (PV) for this first case is $987,500 ($500,000+$487,500). Second, in 1996, MML purchased a reagent line for a similar market size application from the U of V for $1.8 million. The on-going royalty to U of V is not disclosed. However, MML has sold over $17 million in reagents. The PV for the second case is $1.8 million. Finally, in the Spring of 1998, CLM offered to purchase the LABORATORY Inc. technology for a purchase price of $1.7 million and 15% of CLM's stock (at the time with a market cap of $18 million) resulting in an aggregate purchase price valued at $4.4 million. The PV for the third case is, therefore, $1.7 million since a cash value is known and the equity position of $4.4 million should, therefore, not be considered. LABORATORY Inc. itself has spent approximately $300,000 in their development of the core technology and an additional $7.8 million in prototype testing. The last PV is thus $300,000. The amount spent on prototype testing is ignored since accounting rules do not permit treating that amount as a cash asset. The mean of these PV's is $1,196,875, while their coefficient of variation is 0.58. Consequently, the PVP is $694,115. (1,196,875 * 0.58).

The lowest order depreciation linearity is appropriate in this case as there are no indications that market saturation will be effected by LABORATORY Inc. and there will, in all likelihood, remain a strong market interest in this product over a minimum of 60 months. The slope of the depreciation graph is, therefore, 1.

Analysis reveals that this technology characteristically has been licensed to or purchased by national and international corporations. Based on this data, the SPI is 1. In the past 3 years, no company which has an analogous primary asset has raised public equity financing prior to achieving revenue in excess of $60 million. LABORATORY Inc. will not likely be an exception resulting in an asset that the surety will likely sell "as is" on reclamation.

While the primary sector for this technology is in manufacturing/chemicals, uses for some of this platform technology has been evaluated in the OCF analysis in three other areas. At present, the hardware and manufacturing components of LABORATORY Inc.'s technology would have a potential value in analysis of human fluids including serum. Transferring the technology into this arena could have significant attraction based on the present pharmaceutical markets in relevant therapeutic applications. Based on the database maintained in accordance with this invention, comparable value products have about 1.5 times the value in medical applications than in the present sector (OCF_1,=1.5)

Alterations in optical detectors could significantly enhance the performance of the technology increasing its value. A new reflectance photometer capable of discriminating to the μg/ml is currently in beta testing at DP and could be released in 18 months. When that arrives on the scene, the LABORATORY Inc. patents could have significantly more value based on the ability to perform analyses more accurately in about one-half the time. The effect on the marketability of the LABORATORY Inc. products should be positive. (OCF_2 =2.0)

Mass spectrometers in development and now in prototype use in pollution control applications, while capable of doing a similar analysis to LABORATORY Inc.'s technology are currently far too expensive. However, proposed legislation at the Environmental Summit of Helsinki in 1998 mandated that in 3 years, new mass spec technology must be integrated into all exhaust systems. If the mass spectrometry technology would be reduced in price, it could supplant the LABORATORY Inc. technology and while the use patents contemplate non-reflectance analysis, the plataform and reagent patents could have significantly less value (OCF_3=0.70). The aggregate OCF score is the average of the aforementioned scores, or 1.40 ((1.5+2.0+0.70)/3).

If the profit constant (k) is assumed to be 0.8, the asset liquidation value for this example is, therefore:

Asset liquidation value=$694,115*1*1 *1.40*0.80=$777,408

An alternative use for the method of this invention is to enable a lender to calculate an asset liquidation value without relying on a third-party surety. This procedure would provide the lender with an independent evaluation of the risk associated with a loan in the event foreclosure on the intellectual property asset used as collateral becomes necessary. Furthermore, the method of this invention can be used to evaluate multiple intellectual properties either simultaneously or sequentially and may be performed manually in the absence of computer assistance. In applying the process of this invention it is intended that both the process and the information to be used in evaluating and scoring each asset be as uniform as possible from application to application.

The foregoing invention has been described in terms of the preferred embodiment. However, it will be apparent to those skilled in the art that various modifications and varia-

tions can be made in the disclosed process without departing from the scope or spirit of the invention. The specification and examples are exemplary only, while the true scope of the invention is defined by the following claims.

What is claimed is:

1. A method for establishing and enhancing the creditworthiness of at least one intangible asset to be used as collateral for a loan to be made by a lending institution to a loan applicant wherein the proposed loan has a specified amount and specified term for repayment and the intangible asset has utility in at least one market sector comprising the steps of:

assigning a transferability score to the asset by

assembling biographic, organizational, financial and legal data concerning the loan applicant and the intangible asset;

examining said data concerning the loan applicant to determine whether the loan applicant meets minimum, specified criteria;

reviewing said data concerning the intangible asset to determine whether and the degree to which it is transferable; and

attaching a transferability score to each intangible asset of between 0 and 100;

determining a viability score for the asset by

finding the primary market sector for the intangible asset;

ascertaining the life cycle for the intangible asset within the primary market sector;

rejecting the asset evaluation application if said life cycle is shorter than the proposed term of the loan;

establishing the degree of litigation risk associated with the market sector by giving a litigation risk score associated with the market sector to the intangible asset;

rejecting the asset evaluation application if said litigation risk is high;

deciding whether there are additional market sectors for the intangible asset;

ascertaining the life cycle for the intangible asset within the additional market sector, if one exists;

assigning a transplant survival score to the asset if there are no additional market sectors for consideration or if the proposed term of the loan is longer than the life cycle of the asset in any market sector other than the first market sector;

returning to the establishing step if the proposed term of the loan is shorter than the life cycle of the asset in any market sector other than the primary market sector; and

finding the sum of the weighted average of said life cycle, litigation risk score and transplant survival score to yield the viability score;

calculating an asset liquidation value for the asset; and

providing a surety agreement and depreciation schedule to the lending institution wherein, in the event of default on the loan, the surety agreement indicates the promise of the third party to assume ownership of the intangible asset in exchange for a payment to the lending institution in an amount corresponding to a value shown in the depreciation schedule reflecting said asset liquidation value adjusted downward for the length of time which has passed since initiation of the loan.

2. The method of claim 1 wherein the calculating step for the intangible asset further comprises the steps of:

computing a predicate value prediction (PVP);

establishing a depreciation linearity slope (DLS);

projecting a sector proliferative index (SPI);

specifying an orthogonal confidence factor (OCF);

choosing a profit factor (k); and

calculating the asset liquidation value pursuant to the following formula:

asset liquidation value=PVP*DLS*SPI*OCF*k.

3. The method of claim 2 wherein the predicate value prediction is established by

researching comparable industries and market sectors to find and record comparable values which have been offered for or expended on intangible assets comparable to the intangible asset(s) sought to be used as collateral for the loan where such comparable values are based, where known, on the cash value of predicate transactions and, otherwise, calculating estimates based on the use of sector specific standard licensing and royalty terms and annual predicate product sales;

finding the mean value of all such comparable values;

figuring the coefficient of variation for said mean value; and

multiplying the mean value times the coefficient of variation to establish the predicate value prediction.

4. The method of claim 2 wherein the depreciation linearity slope is established by

determining the life of the intangible asset;

formulating a competition score;

ascertaining the product development period;

determining a customer profile score; and

applying dynamic depreciation discriminant analysis with continuous relevance adjustment to said intangible asset life, competition score, product development period and customer profile score figures.

5. The method of claim 2 wherein, prior to calculating the asset liquidation value, the depreciation linearity slope is adjusted by treating the viability score as a percentage and multiplying the viability score times the depreciation linearity slope to determine a final depreciation linearity slope.

6. The method of claim 2 wherein the sector proliferative index for each market sector is established by

examining the growth environment within the sector;

evaluating sector traits;

reviewing the inter-company environment within the sector; and

assigning a value between 0.01 and 1 to the sector proliferative index for that sector based on an analysis of the relationship between the growth environment, sector traits and inter-company environment within that sector.

7. The method of claim 6 wherein said transferability score is used as a weighting factor in determining the sector proliferative index.

8. The method of claim 2 wherein the orthogonal confidence factor is established by

determining, addition to the primary market sector, which and how many parallel or corollary market sectors currently and prospectively exist for the intangible asset;

projecting an orthogonal confidence factor for each of those parallel or corollary market sectors; and

finding the mean value of all of the orthogonal confidence factors so projected.

9. The method of claim 8 wherein the projecting step includes applying dynamic discriminant analysis with continuous relevance adjustment to restrospective and prospective orthogonal data.

10. The method of claim 8 wherein there are at least a total of three market sectors including the primary market sector for which orthogonal confidence factors are projected.

11. The method of claim 1 which is computer assisted.

12. A user-based interactive computer system for establishing and enhancing the creditworthiness of at least one intangible asset to be used as collateral for a loan to be made by a lending institution to a loan applicant wherein the proposed loan has a specified amount and specified term for repayment, the intangible asset has utility in at least one market sector and the lender is provided a guarantee of payment in the amount of a depreciated asset liquidation value calculated based on multiple scoring functions performed by the system in the event the loan applicant defaults on the loan comprising:

user CPU means for entering biographic, organizational, financial and legal data concerning the loan applicant and the asset into the system and for receiving interactive input from and transmitting data to the user;

display means for providing the user with hard copy and visual display of the data entered into and generated by the system;

storage means for receiving and storing the biographic, organizational, financial and legal data concerning the loan applicant and the asset, for storing other data retrieved from sources external to the system and for maintaining experiential data representing the accuracy of decisions made by the system in the past;

expert system CPU means for applying heuristic rules to solve scoring, indexing and valuation problems and for performing data management and actuarial modeling of historical and prospective events which may impact the asset liquidation value based in part on the experiential data stored in said storage means;

scoring system CPU means for applying statistical models to build scoring functions based on associated quantitative input attributes in order to objectively evaluate the creditworthiness of the loan applicant and the asset;

critiquing system CPU means for comparing the reasoning and input of the user with the results generated by said expert system CPU means and said scoring system CPU means and for notifying the user of discrepancies and reasoning errors; and

supervisory CPU means connected to each of said user CPU means, said expert system CPU means, said scoring system CPU means, said critiquing CPU means and said storage means for coordinating, organizing and relaying communications between said user CPU means, said expert system CPU means, said scoring system CPU means, said critiquing CPU means and said storage means.

13. A computer-assisted method for valuing at least one intangible asset having utility in at least one market sector comprising the steps of:

assigning a transferability score to the asset by

assembling biographic, organizational, financial and legal data concerning the intangible asset;

reviewing said data concerning the intangible asset to determine whether and the degree to which it is transferable; and

attaching a transferability score to each intangible asset of between 0 and 100;

determining a viability score for the asset by

finding the primary market sector for the intangible asset;

ascertaining a life cycle for the intangible asset within the primary market sector;

establishing the degree of litigation risk associated with the market sector by giving a litigation risk score associated with the market sector to the intangible asset;

deciding whether there are additional market sectors for the intangible asset;

ascertaining the life cycle for the intangible asset within the additional market sector, if one exists;

assigning a transplant survival score to the asset if there are no additional market sectors for consideration; and

finding the sum of the weighted average of said life cycle, litigation risk score and transplant survival score to yield the viability score; and

calculating an asset liquidation value for the asset.

14. The method of claim 13 wherein the calculating step for the intangible asset further comprises the steps of:

computing a predicate value prediction (PVP);

establishing a depreciation linearity slope (DLS);

projecting a sector proliferative index (SPI);

specifying an orthogonal confidence factor (OCF);

choosing a profit factor (k); and

calculating the asset liquidation value pursuant to the following formula:

asset liquidation value=PVP*DLS*SPI*OCF*k.

15. The method of claim 14 wherein the predicate value prediction is established by:

researching comparable industries and market sectors to find and record comparable values which have been offered for or expended on intangible assets comparable to the intangible asset(s) being valued where such comparable values are based, where known, on the cash value of predicate transactions and, otherwise, calculating estimates based on the use of sector specific standard licensing and royalty terms and annual predicate product sales;

finding the mean value of all such comparable values;

figuring the coefficient of variation for said mean value; and

multiplying the mean value times the coefficient of variation to establish the predicate value prediction.

16. The method of claim 14 wherein the depreciation linearity slope is established by:

determining the life of the intangible asset;

formulating a competition score;

ascertaining a product development period;

determining a customer profile score; and

applying dynamic depreciation discriminant analysis with continuous relevance adjustment to said intangible asset life, competition score, product development period and customer profile score figures.

17. The method of claim 14 wherein, prior to calculating the asset liquidation value, the depreciation linearity slope is adjusted by treating the viability score as a percentage and multiplying the viability score times the depreciation linearity slope to determine a final depreciation linearity slope.

18. The method of claim 14 wherein the sector proliferative index for each market sector is established by

examining the growth environment within the sector;

evaluating sector traits;

reviewing the inter-company environment within the sector; and

assigning a value between 0.01 and 1 to the sector proliferative index for that sector based on an analysis of the relationship between the growth environment, sector traits and inter-company environment within that sector.

19. The method of claim 18 wherein said transferability score is used as a weighting factor in determining said sector proliferative index.

20. The method of claim 14 wherein the orthogonal confidence factor is established by:

determining, in addition to the primary market sector, which and how many parallel or corollary market sectors currently and prospectively exist for the intangible asset;

projecting an orthogonal confidence factor for each of those parallel or corollary market sectors; and

finding the mean value of all of the orthogonal confidence factors so projected.

21. The method of claim 20 wherein the projecting step includes applying dynamic discriminant analysis with continuous relevance adjustment to retrospective and prospective orthogonal data.

22. The method of claim 20 wherein there are at least a total of three market sectors including the primary market sector for which orthogonal confidence factors are projected.

* * * * *

6556992B1

(12) **United States Patent**
Barney et al.

(10) **Patent No.: US 6,556,992 B1**
(45) **Date of Patent: Apr. 29, 2003**

(54) **METHOD AND SYSTEM FOR RATING PATENTS AND OTHER INTANGIBLE ASSETS**

(75) Inventors: **Jonathan A. Barney**, Newport Beach, CA (US); **James R. Barney**, McLean, VA (US)

(73) Assignee: **Patent Ratings, LLC**, Newport Beach, CA (US)

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Related U.S. Application Data

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(51) **Int. Cl.**[7] **G06F 17/30**
(52) **U.S. Cl.** **707/6**; 707/7
(58) **Field of Search** 707/6, 1, 2, 3, 707/4, 5, 7, 10, 101, 102, 104; 706/45

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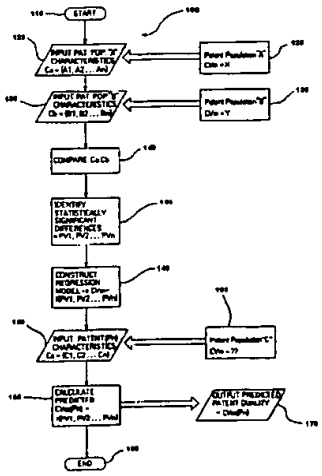
Primary Examiner—Sanjiv Shah

(57) **ABSTRACT**

A statistical patent rating method and system is provided for independently assessing the relative breadth ("B"), defensibility ("D") and commercial relevance ("R") of individual patent assets and other intangible intellectual property assets. The invention provides new and valuable information that can be used by patent valuation experts, investment advisors, economists and others to help guide future patent investment decisions, licensing programs, patent appraisals, tax valuations, transfer pricing, economic forecasting and planning, and even mediation and/or settlement of patent litigation lawsuits. In one embodiment the invention provides a statistically-based patent rating method and system whereby relative ratings or rankings are generated using a database of patent information by identifying and comparing various characteristics of each individual patent to a statistically determined distribution of the same characteristics within a given patent population. For example, a first population of patents having a known relatively high intrinsic value or quality (e.g. successfully litigated patents) is compared to a second population of patents having a known relatively low intrinsic value or quality (e.g. unsuccessfully litigated patents). Based on a statistical comparison of the two populations, certain characteristics are identified as being more prevalent or more pronounced in one population group or the other to a statistically significant degree. Multiple such statistical comparisons are used to construct and optimize a computer model or computer algorithm that can then be used to predict and/or provide statistically-accurate probabilities of a desired value or quality being present or a future event occurring, given the identified characteristics of an individual patent or group of patents.

66 Claims, 8 Drawing Sheets



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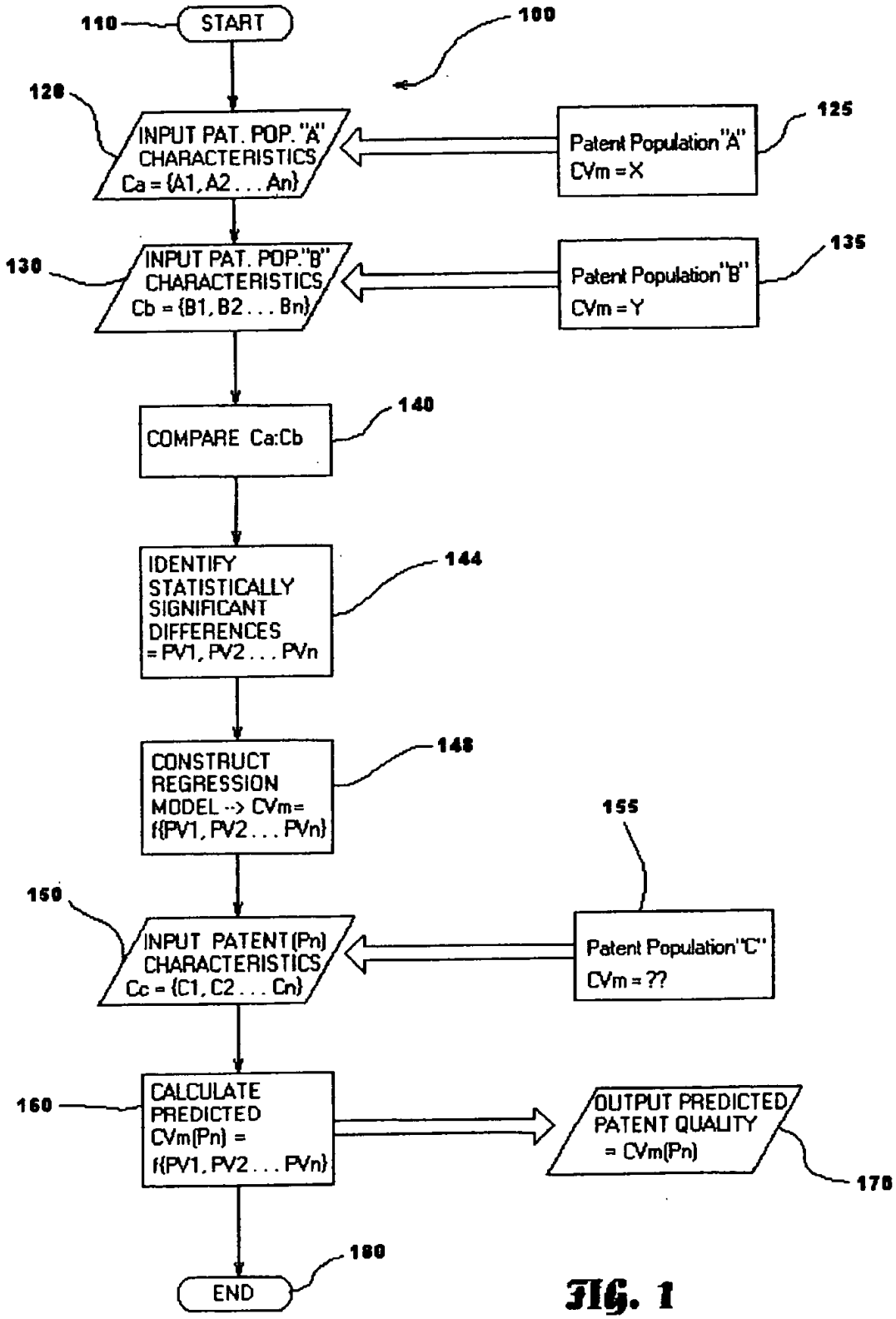
110
START
100
120
INPUT PAT. POP. "A" CHARACTERISTICS Ca = {A1, A2 . . . An}
Patent Population "A" CVm = X
125
130
INPUT PAT. POP. "B" CHARACTERISTICS Cb = {B1, B2 . . . Bn}
Patent Population "B" CVm = Y
135
COMPARE Ca:Cb
140
IDENTIFY STATISTICALLY SIGNIFICANT DIFFERENCES = PV1, PV2 . . . PVn
144
CONSTRUCT REGRESSION MODEL --> CVm= f{PV1, PV2 . . . PVn}
148
155
150
INPUT PATENT (Pn) CHARACTERISTICS Cc = {C1, C2 . . . Cn}
Patent Population "C" CVm = ??
160
CALCULATE PREDICTED CVm(Pn) = f{PV1, PV2 . . . PVn}
OUTPUT PREDICTED PATENT QUALITY = CVm(Pn)
170
180
END

FIG. 1

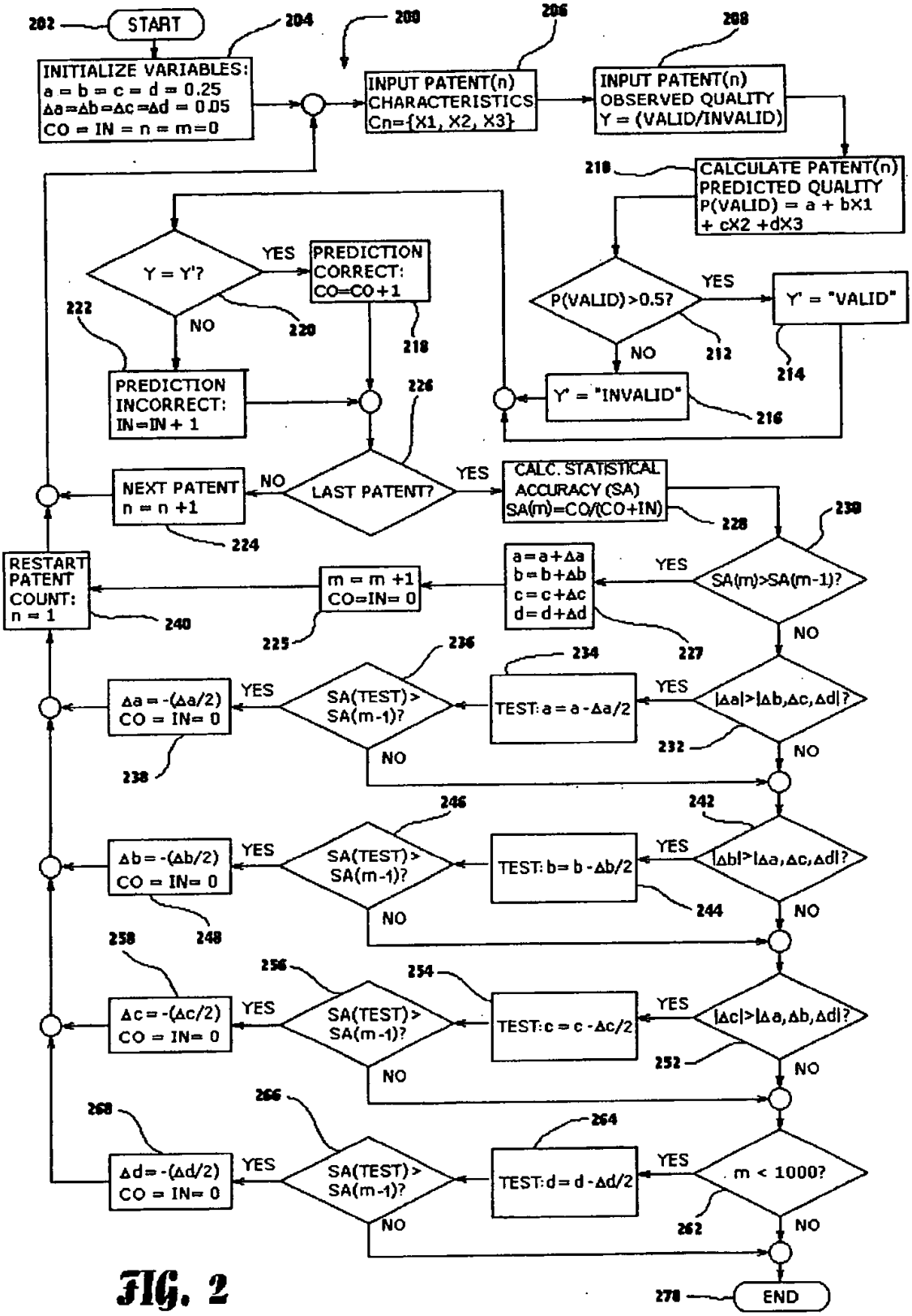
202
START
204
INITIALIZE VARIABLES:
a = b = c = d = 0.25
Δa=Δb=Δc=Δd = 0.05
CO = IN = n = m=0
208
INPUT PATENT(n)
CHARACTERISTICS
Cn={X1, X2, X3}
206
INPUT PATENT(n)
OBSERVED QUALITY
Y = (VALID/INVALID)
210
CALCULATE PATENT(n)
PREDICTED QUALITY
P(VALID) = a + bX1
+ cX2 +dX3
Y = Y'?
YES
PREDICTION
CORRECT:
CO=CO+1
NO
220
218
222
PREDICTION
INCORRECT:
IN=IN + 1
226
P(VALID)>0.5?
YES
Y' = "VALID"
NO
212
214
Y' = "INVALID"
216
NEXT PATENT
n = n +1
NO
LAST PATENT?
YES
224
CALC. STATISTICAL
ACCURACY (SA)
SA(m)=CO/(CO+IN)
228
230
RESTART
PATENT
COUNT:
n = 1
240
m = m +1
CO=IN= 0
225
a=a+Δa
b=b+Δb
c=c+Δc
d=d+Δd
227
YES
SA(m)>SA(m-1)?
NO
Δa = -(Δa/2)
CO = IN= 0
YES
238
236
SA(TEST) >
SA(m-1)?
NO
234
TEST: a = a -Δa/2
YES
|Δa|>|Δb,Δc,Δd|?
232
NO
Δb = -(Δb/2)
CO = IN= 0
YES
248
246
SA(TEST) >
SA(m-1)?
NO
TEST: b= b -Δb/2
YES
244
242
|Δb|>|Δa,Δc,Δd|?
NO
Δc = -(Δc/2)
CO = IN= 0
YES
258
256
SA(TEST) >
SA(m-1)?
NO
254
TEST: c = c -Δc/2
YES
|Δc|>|Δa,Δb,Δd|?
252
NO
Δd = -(Δd/2)
CO = IN= 0
YES
268
266
SA(TEST) >
SA(m-1)?
NO
264
TEST: d = d -Δd/2
YES
m < 1000?
262
NO
278
END

FIG. 2

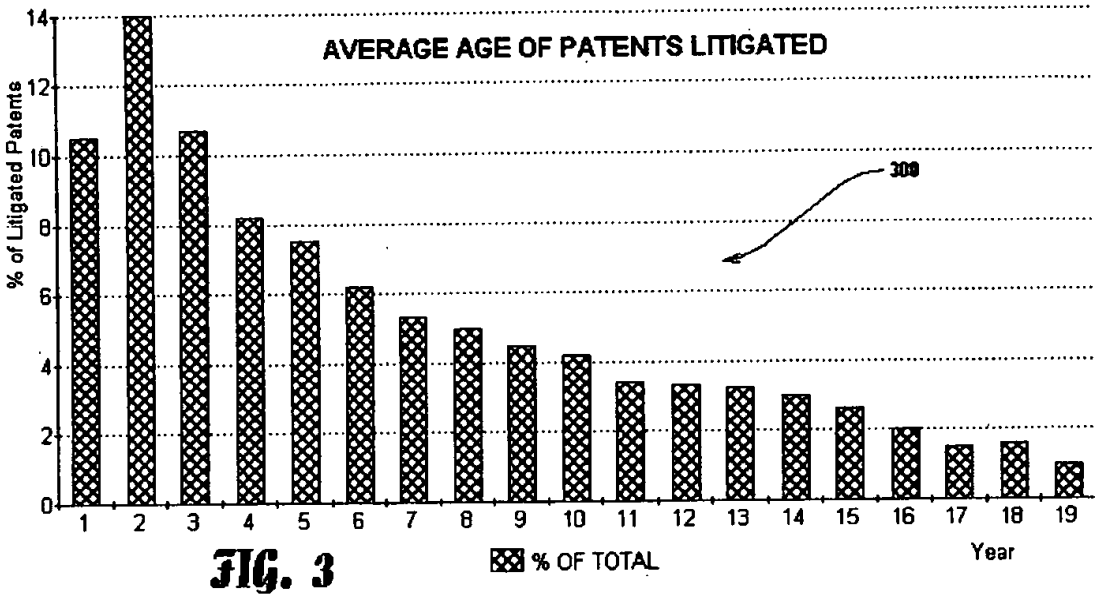
AVERAGE AGE OF PATENTS LITIGATED
% of Litigated Patents
300
0
2
4
6
8
10
12
14
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
% OF TOTAL
Year

FIG. 3

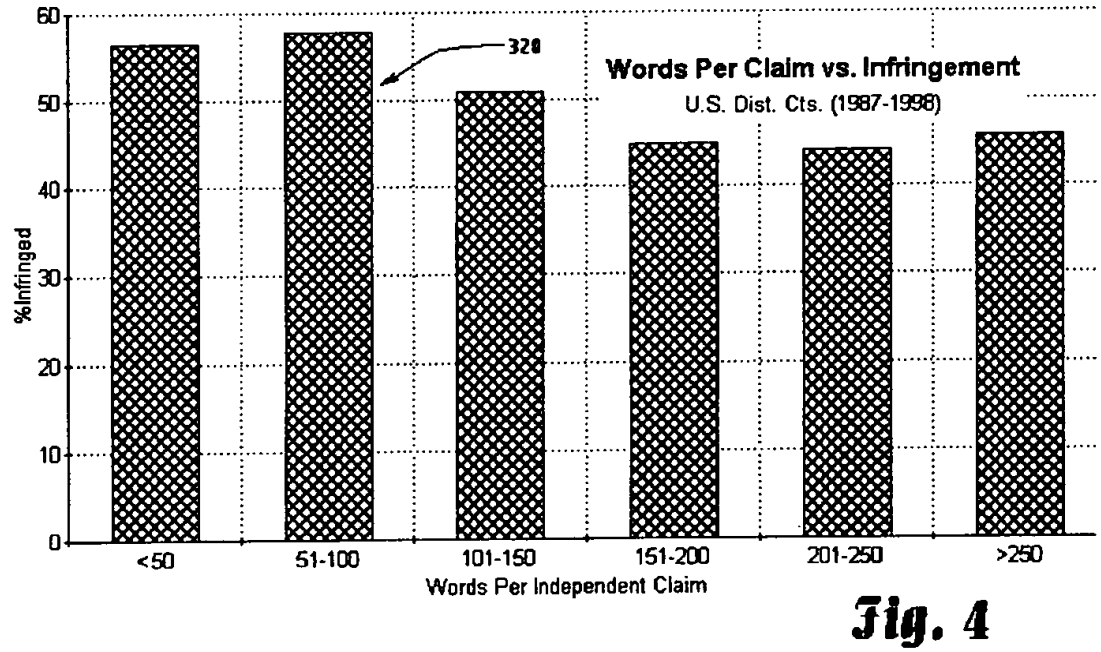
320
Words Per Claim vs. Infringement
U.S. Dist. Cts. (1987-1998)
%Infringed
0
10
20
30
40
50
60
<50
51-100
101-150
151-200
201-250
>250
Words Per Independent Claim

Fig. 4

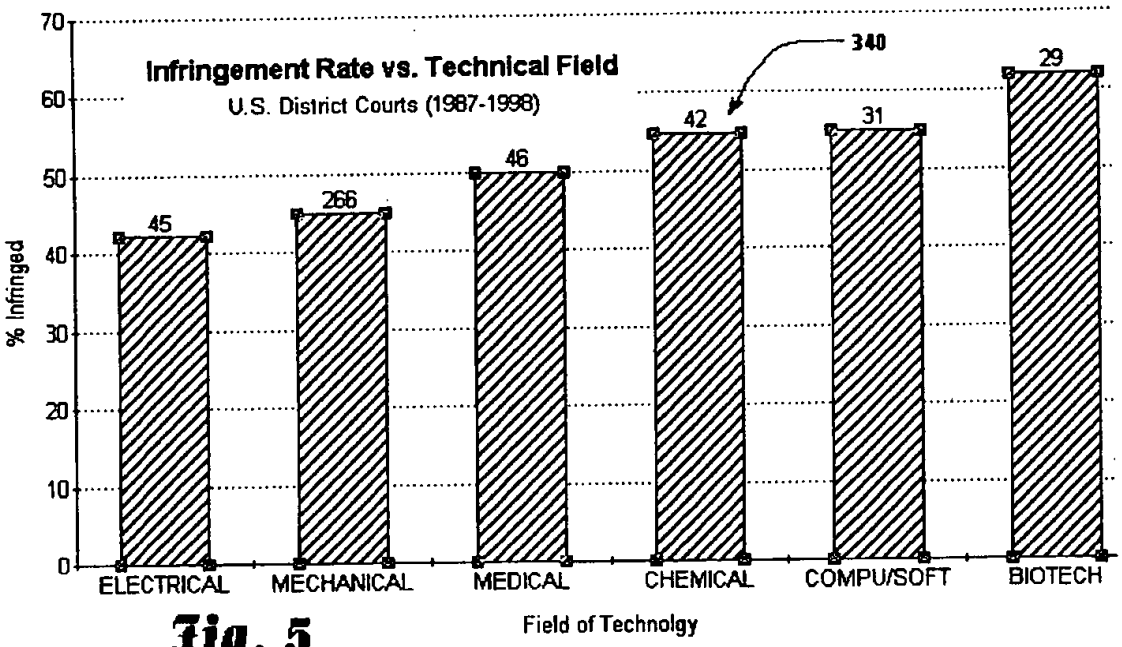
Infringement Rate vs. Technical Field
U.S. District Courts (1987-1998)
% Infringed
70
60
50
40
30
20
10
0
45
266
46
42
340
31
29
ELECTRICAL
MECHANICAL
MEDICAL
CHEMICAL
COMPU/SOFT
BIOTECH
Field of Technolgy

Fig. 5

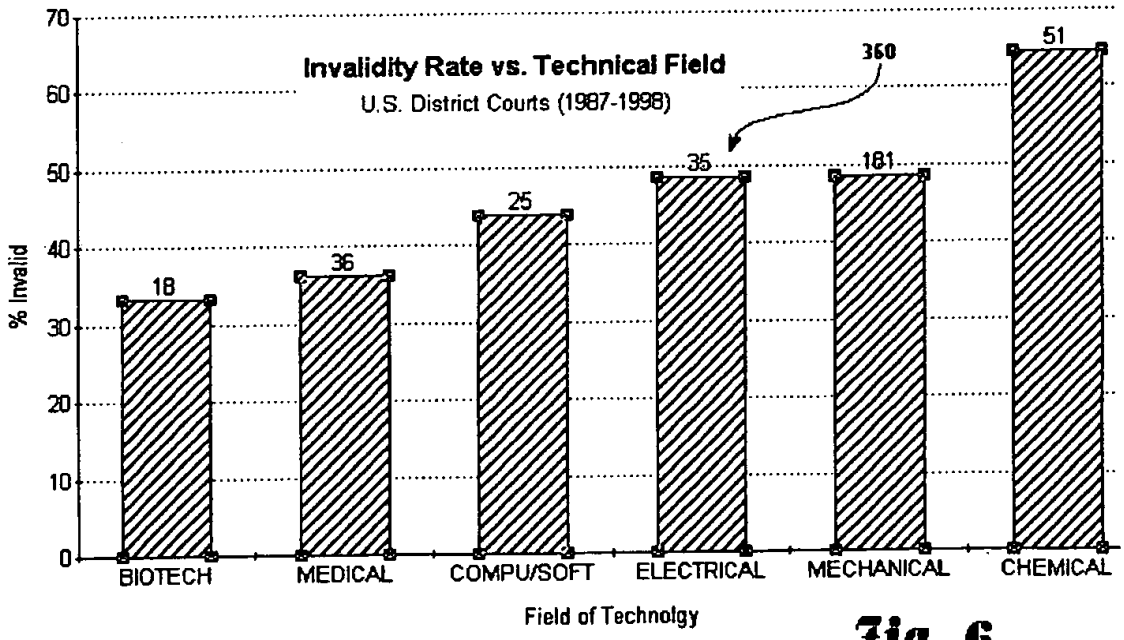
Invalidity Rate vs. Technical Field
U.S. District Courts (1987-1998)
% Invalid
70
60
50
40
30
20
10
0
18
36
25
35
360
181
51
BIOTECH
MEDICAL
COMPU/SOFT
ELECTRICAL
MECHANICAL
CHEMICAL
Field of Technolgy

Fig. 6

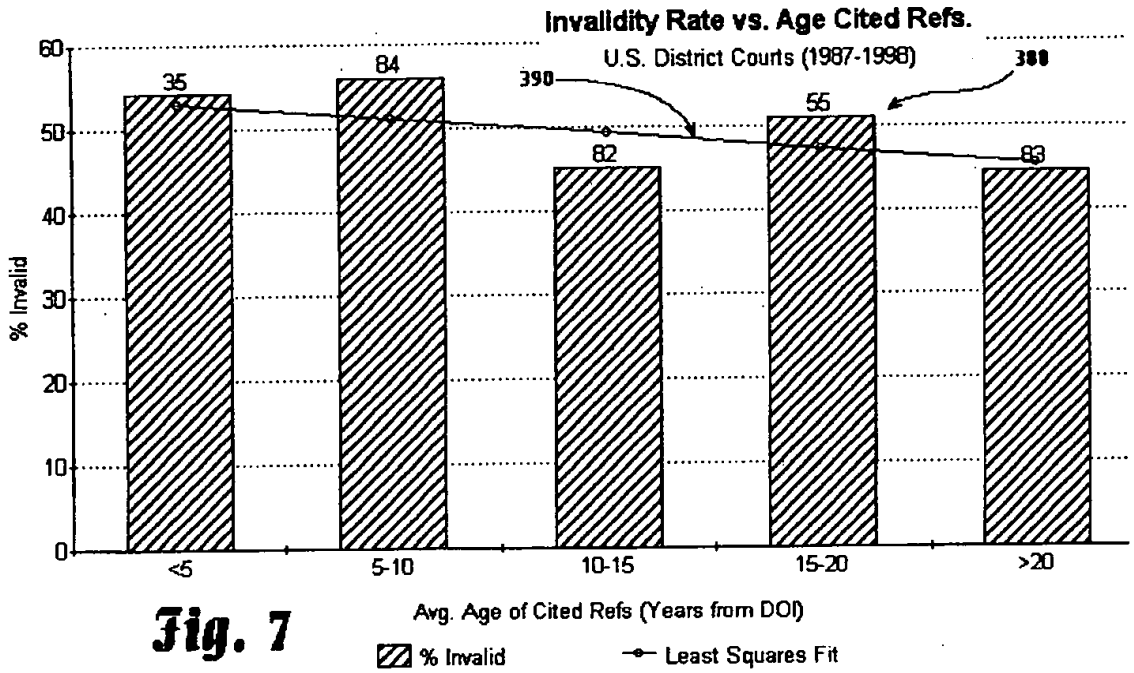
Invalidity Rate vs. Age Cited Refs.
U.S. District Courts (1987-1998)
% Invalid
60
50
40
30
20
10
0
35
84
82
55
83
390
388
<5
5-10
10-15
15-20
>20
Avg. Age of Cited Refs (Years from DOI)
% Invalid
Least Squares Fit

Fig. 7

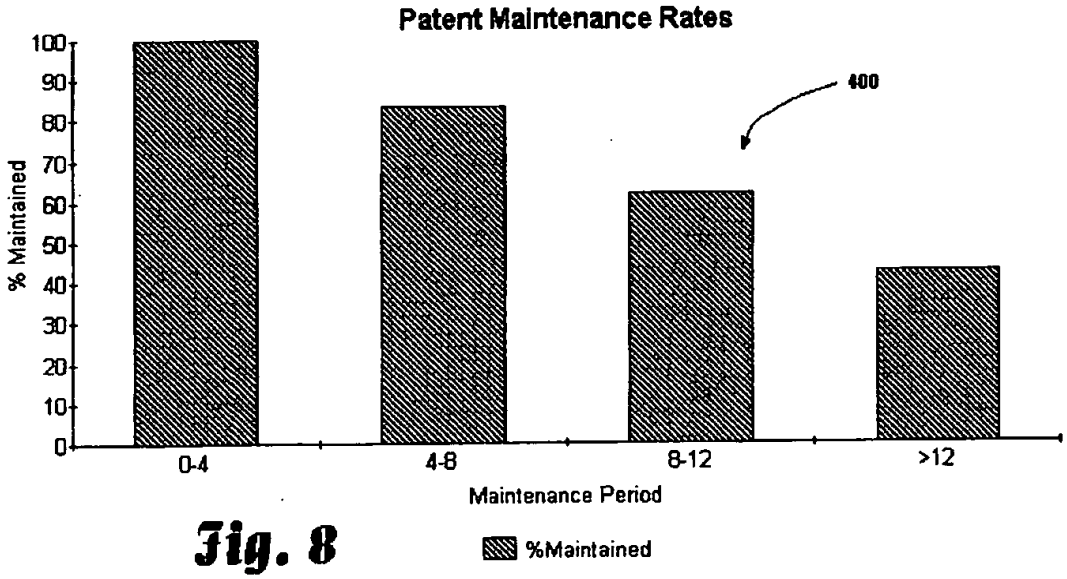
Patent Maintenance Rates
% Maintained
100
90
80
70
60
50
40
30
20
10
0
400
0-4
4-8
8-12
>12
Maintenance Period
%Maintained

Fig. 8

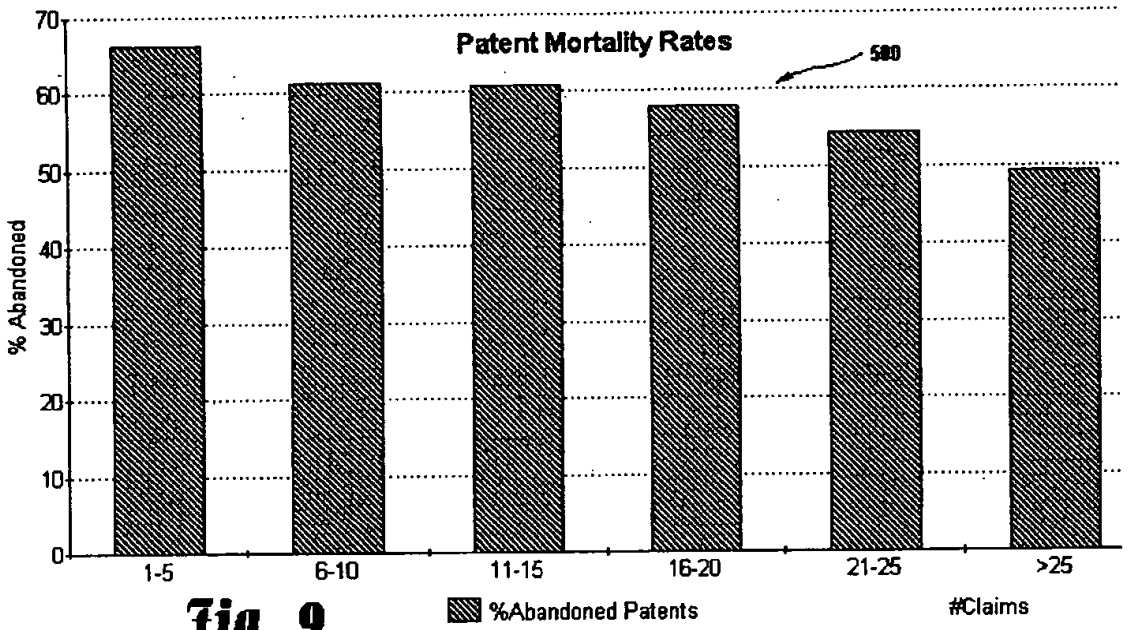
Patent Mortality Rates
500
% Abandoned
70
60
50
40
30
20
10
0
1-5
6-10
11-15
16-20
21-25
>25
%Abandoned Patents
#Claims

Fig. 9

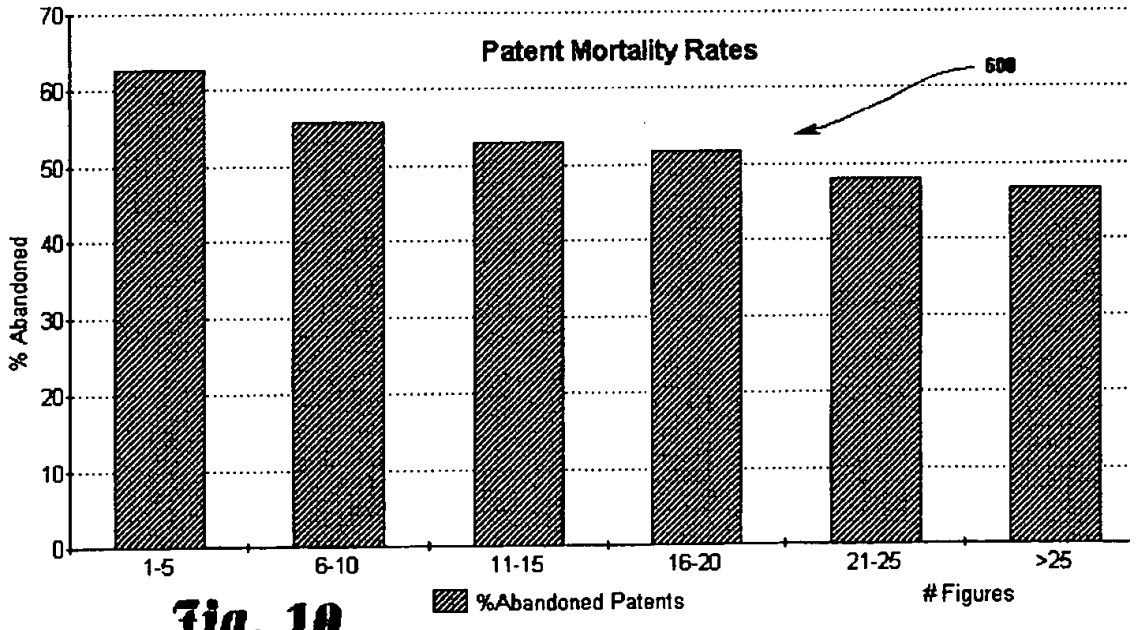
Patent Mortality Rates
600
% Abandoned
70
60
50
40
30
20
10
0
1-5
6-10
11-15
16-20
21-25
>25
%Abandoned Patents
Figures

Fig. 10

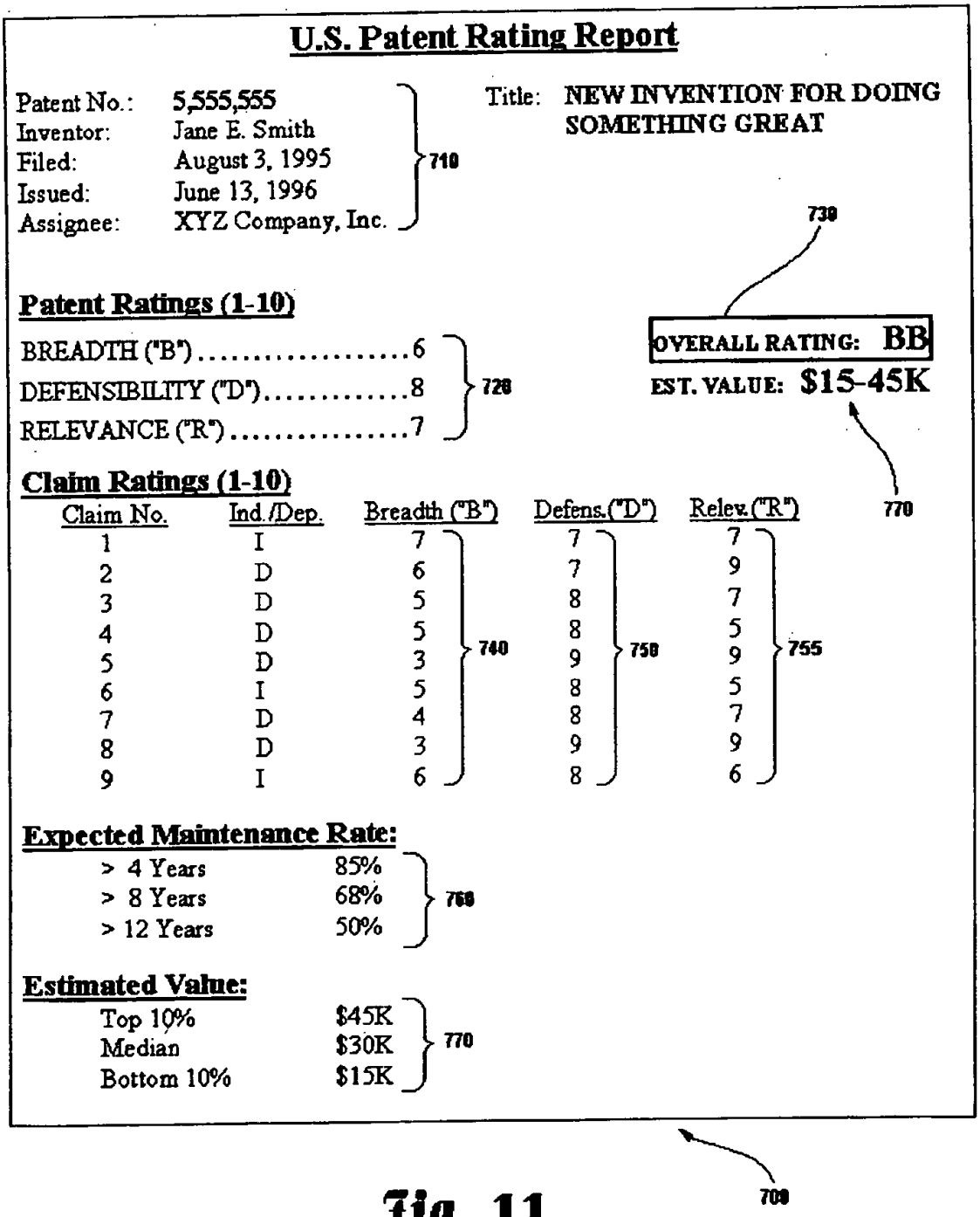
U.S. Patent Rating Report
Patent No.: 5,555,555
Inventor: Jane E. Smith
Filed: August 3, 1995
Issued: June 13, 1996
Assignee: XYZ Company, Inc.
710
Title: NEW INVENTION FOR DOING SOMETHING GREAT
739
Patent Ratings (1-10)
BREADTH ("B").....6
DEFENSIBILITY ("D").....8
RELEVANCE ("R").....7
720
OVERALL RATING: BB
EST. VALUE: $15-45K
770
Claim Ratings (1-10)
Claim No. | Ind./Dep. | Breadth ("B") | Defens.("D") | Relev.("R")
1 | I | 7 | 7 | 7
2 | D | 6 | 7 | 9
3 | D | 5 | 8 | 7
4 | D | 5 | 8 | 5
5 | D | 3 | 9 | 9
6 | I | 5 | 8 | 5
7 | D | 4 | 8 | 7
8 | D | 3 | 9 | 9
9 | I | 6 | 8 | 6
740
750
755
Expected Maintenance Rate:
> 4 Years 85%
> 8 Years 68%
> 12 Years 50%
760
Estimated Value:
Top 10% $45K
Median $30K
Bottom 10% $15K
770
700

Fig. 11

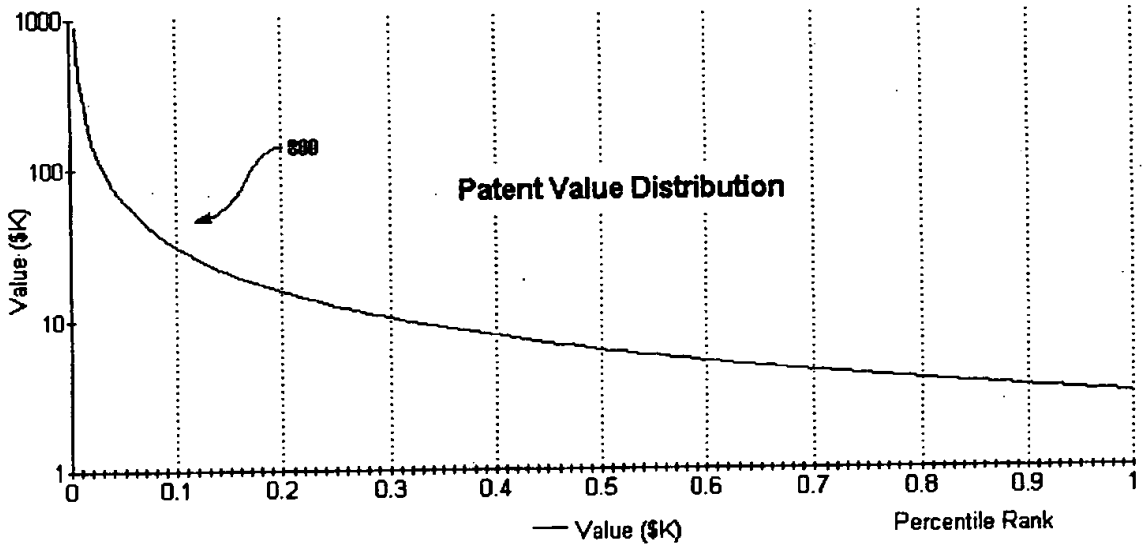
1000
100
10
1
Value ($K)
Patent Value Distribution
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
Value ($K)
Percentile Rank

Fig. 12

METHOD AND SYSTEM FOR RATING PATENTS AND OTHER INTANGIBLE ASSETS

RELATED APPLICATIONS

This application claims priority under 37 C.F.R. §119(e) to U.S. provisional patent application Ser. No. 60/154,066, filed Sep. 14, 1999.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to the field of asset valuation and, in particular, to the field of valuing or rating patents and other intellectual property assets.

2. Description of the Related Art

Patents play an important role in our economy in encouraging private investment in the development of new technologies that improve productivity and quality of life for everyone. Each year more than a quarter-million patent applications are filed in the United States Patent and Trademark Office ("PTO") resulting annually in the issuance of over a hundred fifty-thousand patents. Patent owners and applicants pay combined annual fees and costs of nearly a billion dollars (about $6,700 per issued patent) to the PTO to prosecute and maintain their patents and applications. This does not include the additional fees and costs expended for related professional services, such as attorneys fees and drafting charges.

In addition, each year thousands of patent infringement suits are brought in the federal courts seeking to enforce patent rights. In the 12 months ended Jun. 30, 1992, U.S. federal district courts heard a total of 1407 such patent cases through trial. See V. Savikas, "Survey Lets Judges Render Some Opinions About the Patent Bar," Nat'l L. J., Jan. 18, 1993, at 57. A recent survey conducted by the American Intellectual Property Law Associations ("AIPLA") reported that the median cost of patent litigation for each side through trial was about $650,000. AIPLA., "Report of Economic Survey" (1991). Other more recent estimates place the cost of patent enforcement litigation somewhere in the range of about $1 million per side through trial. Thus, the aggregate annual cost for obtaining, maintaining and enforcing patents in the United States is easily in the multiple billions of dollars. Similar costs are incurred by patentees in various other foreign countries where patents may be obtained and enforced.

Because of the great importance of patents in the both the U.S. and global economies there has been continued interest in quantifying the intrinsic value of patents and their contribution to economic prosperity of the individuals or companies that hold and/or control them. Such information can be useful for a variety of purposes. For example, patent holders themselves may be interested in using such information to help guide future decision-making or for purposes of tax treatment, transfer pricing or settlement of patent license disputes. Financial advisors and investors may seek to use such information for purposes of comparative value analysis and/or to construct measures of the "fundamental value" of publicly traded companies for purposes of evaluating possible strategic acquisitions or as a guide to investment. Economists may seek to use patent valuations for purposes of economic forecasting and planning. Insurance carriers may use such valuations to set insurance policy premiums and the like for insuring intangible assets. See, e.g., U.S. Pat. No. 6,018,714, incorporated herein by reference.

However, accurate valuing of patents and other intangible intellectual property assets is a highly difficult task and requires an understanding of a broad range of legal, technical and accounting disciplines. Intellectual property assets are rarely traded in open financial markets or sold at auction. They are intangible assets that secure unique benefits to the individuals or companies that hold them and/or exploit the underlying products or technology embodying the intellectual property. In the case of patent assets, for example, this unique value may manifest itself in higher profit margins for patented products, increased market power and/or enhanced image or reputation in the industry and/or among consumers or investors. These and other characteristics of intellectual property assets make such assets extremely difficult to value.

Intellectual property valuation specialists have traditionally employed three main approaches for valuing patents and other intangible intellectual property assets. These are: (1) the cost-basis approach; (2) the market approach; and (3) the income approach. See, generally, Smith & Par, *Valuation of Intellectual Property and Intangible Assets,* 2nd Ed. 1989. Each of these traditional accounting-based approaches produces a different measure or estimate of the intrinsic value of a particular intellectual property asset in question. The choice of which approach is appropriate to use in a given circumstance for a given asset is typically determined by a professional accountant or valuation specialist, taking into consideration a variety of underlying assumptions, type of intellectual property asset(s) involved, and how such asset(s) are to be employed or exploited. Each of these approaches and the limitations associated therewith are briefly discussed below.

Cost Basis Approach

The first and simplest approach is the so-called cost-basis approach. This approach is often used for tax appraisal purposes or for simple "book value" calculations of a company's net assets. Underlying this valuation method is the basic assumption that intellectual property assets, on average, have a value roughly equal to their cost-basis. The supporting rationale is that individuals and companies invest in intellectual property asset(s) only when the anticipated economic benefits of the rights to be secured by the intellectual property asset(s) exceed the anticipated costs required to obtain the asset(s), taking into account appropriate risk factors, anticipated rates of return, etc. In theory, a rational economic decision-maker would not invest in a patent or other intellectual property asset if he or she did not believe that it would produce expected economic benefits (tangible or otherwise) at least equal to its anticipated cost-basis.

There are several drawbacks or limitations associated with the cost-basis valuation approach which limit its general applicability. One significant drawback is that the approach assumes a rational economic decision-maker. While such assumption might be statistically valid on a macro scale where many individual decisions and decision-makers are implicated (e.g., valuing all patents or a large subset of all patents), it is not necessarily a valid assumption when conducting valuation analysis on a micro scale (e.g., valuing a single patent or a portfolio of patents). It is one thing to assume that, on average, individual investment decisions and decision-makers are rational and economically motivated. It is a wholly different thing to assume that "each" investment decision or decision-maker is rational and economically motivated.

For a variety of reasons certain individuals or companies may invest uneconomically in patents or other intellectual

property assets—for example, to achieve personal recognition or to superficially "dress up" balance sheets to attract potential investors or buyers. A variety of individual psychological factors may also influence investment decisions producing sometimes irrational or non-economical decisions. For example, the so-called "lottery effect" may encourage some individuals or companies to over-invest in highly speculative technologies that have the seductive allure of potentially huge economic rewards, but very little if any probability of success. Yet others may invest uneconomically in patents and/or other intellectual property assets because of fundamental misunderstandings or misinformation concerning the role of intellectual property and how it can be realistically and effectively exploited.

But even assuming a well-informed, rational, economically-motivated decision-maker, the cost-basis approach is still susceptible to inherent uncertainties in the decision-maker's informed and honest projections of the anticipated economic benefits to be gained by a patent or other intellectual property asset. These benefits are often unknown even to the patentee until well after the patent has been applied for and often not until long after the patent has issued. Many new inventions that may look promising on paper or in the laboratory turn out to be economically or commercially infeasible for a variety of reasons and, as a result, patents covering such inventions may have little if any ultimate intrinsic economic value. Other inventions that may seem only marginal at the time the patent is applied for may turn out to be extremely valuable and, if a broad scope of protection is obtained, may return economic benefits far in excess of the cost-basis of the patent. The cost basis approach thus fails to differentiate between these two extremes because (all other things being equal) the cost basis is the same for securing a patent on the worthless invention as it is for securing a patent on the valuable invention.

The cost-basis approach also does not account for the possibility of evolution of products and technology over time and changing business and economic conditions. Rather, the cost-basis approach implicitly assumes a static business and economic environment, providing a fixed value based on actual costs expended at the time of the initial investment without taking into account how the value of that investment might change over time. As a result of these and other short-comings, the cost-basis approach has only limited utility as a method for accurately estimating the intrinsic economic value of patents or other intellectual property assets in real-world business environments.

Market Approach

The second traditional valuation approach—the market approach—seeks to provide real-world indications of value by studying transactions of similar assets occurring in free and open markets. In theory, the market approach can provide very accurate measures or estimates of intrinsic value. In practice, however, there are very few open financial markets that support active trading of intellectual property and other similar intangible assets. Most intellectual property assets are bought or sold in private transactions involving sales of entire businesses or portions of businesses. And even if the financial particulars of each such transaction were readily available, it would be difficult, if not impossible, to disaggregate the intellectual property assets involved in the transaction from the other assets and allocate an appropriate value to them.

As a result of these and other practical difficulties, there is presently very little direct real-world data on which to base market comparisons of intellectual property and other similar intangible assets. Nevertheless, several interesting studies have been reported which attempt indirectly to extract market-based valuations of patents and other intellectual property assets by studying the stock prices of various publicly traded companies that hold such assets. See, Hall, "Innovation and Market Value," Working Paper No. 6984 NBER (1999); and Cockburn et al., "Industry Effects and Appropriability Measures in the Stock Market's Valuation of R&D and Patents," Working Paper No. 2465 NBER (1987).

While interesting in their approach, the usefulness of the methodologies taught by these studies in terms of valuing individual patent and other intellectual property assets is limited. Such indirect market-based valuation approaches mostly attempt to establish only a generalized correlation between stock prices of publicly traded companies and the aggregate number of intellectual property assets held or controlled by those companies. Because individual stock prices are generally reflective of the overall aggregated assets of a company and its future earnings potential, such indirect market-valuation approaches do not lend themselves readily to valuing individual identified intellectual property assets. Moreover, intellectual property and other intangible assets owned by publicly traded companies comprise only a fraction of the total population of potential intellectual property assets that may be of interest.

A computer-automated variation of the traditional market approach specifically adapted for rating patent portfolios is described in U.S. Pat. No. 5,999,907. In this case, a first database is provided containing information describing selected characteristics of a portfolio of patents to be acquired. A second database is provided containing empirical data describing selected characteristics of representative patent portfolios having known market values. Estimated valuations are obtained by comparing information in the first data base to information in the second database to determine which known patent portfolio the portfolio to be acquired matches the closest. The value of the closest matching known portfolio is then used as a rough approximation of the value of the portfolio to be acquired.

While such approach provides an innovative variation of the market-based valuation technique described above, it is again ultimately limited by the need to acquire relevant market data of known patent portfolios. As noted above, such information is very difficult to obtain. Unless a large amount of such data could be collected and analyzed, the effectiveness and accuracy of such an approach would be very limited. Even if a large amount of such data could be collected and stored in a suitable computer-accessible database, the process of individually retrieving and comparing relevant characteristics of each representative portfolio in the database would be undesirably time consuming, even using a high-speed computer. Moreover, the statistical accuracy of the resulting approximated valuations would be undetermined.

Income Approach

The third and perhaps most commonly used accounting-based approach for valuing intellectual property and other intangible assets is the so-called income approach. This approach can provide accurate and credible valuations of intellectual property assets in certain situations where an isolated stream (or streams) of economic benefit can be identified and attributed to an intellectual property asset in question. The income approach values an intellectual property asset by capitalizing or discounting to present value all future projected revenue streams likely to be derived from

its continued exploitation. For example, if a patent asset is licensed under an agreement that provides for a predictable income stream over a certain period of time into the future, then the intrinsic value of the patent may be accurately calculated by taking the net discounted present value of the residual income stream (less any scheduled maintenance costs). Similarly, if the patentee is directly exploiting the patent itself, the intrinsic value of the patent may be calculated by taking the net discounted value of the incremental profit stream (assuming it can be identified) attributable to the patent over the remaining life of the patent or the economic life of the patented technology.

In theory, the income valuation approach can produce very accurate estimates of intrinsic value for certain intellectual property and other intangible assets. In practice, however, it is often difficult to identify with certainty and precision an isolated income stream attributable to a particular intellectual property asset in question, let alone an income stream that is predictable over time. In addition, many intellectual property assets, particularly newly issued patents, are not licensed or exploited at all and, therefore, there are no identifiable income streams upon which to base a valuation.

In such circumstances many asset valuation specialists attempt to project possible or hypothetical future revenue streams or economic benefits based on available data of other similar companies in the industry and/or other license agreements for similar intellectual property assets in the same general technical field. Some patent valuation experts have even established extensive data-bases of patent licenses and have attempted to establish a schedule of "standard" or baseline royalty rates or royalty ranges for patent licenses in various industries for purposes of forecasting possible future revenue streams. While such information can be very helpful, without an actual demonstrated income stream or other proven economic benefit, the income-based valuation approach loses credibility and can become more speculation than valuation.

Each of the above valuation approaches has its characteristic strengths and weaknesses. Of course, no single valuation method can provide absolute certainty of the true intrinsic value of an asset. This is especially true when valuing patents and other intangible intellectual property assets. Nevertheless, a need exists for a comparative valuation technique that overcomes the aforementioned problems and limitations and which does not require collecting comparative market data of existing patent portfolios or calculating future hypothetical income streams or royalty rates. There is a further need for an intellectual property valuation method that produces statistically accurate valuations, ratings or rankings according to a determined statistical accuracy.

SUMMARY OF THE INVENTION

The present invention compliments and improves upon traditional valuation approaches by providing an objective, statistical-based rating method and system for independently assessing the relative breadth ("B"), defensibility ("D") and commercial relevance ("R") of individual patent assets and other intangible intellectual property assets according to a determined statistical accuracy. Thus, the invention can be used to provide new and valuable information that can be used by patent valuation experts, investment advisors, economists and others to help guide future patent investment decisions, licensing programs, patent appraisals, tax valuations, transfer pricing, economic forecasting and planning, and even mediation and/or settlement of patent litigation lawsuits.

In one embodiment the invention provides a statistically-based patent rating method and system whereby relative ratings or rankings are generated using a database of patent information by identifying and comparing various characteristics of each individual patent to a statistically determined distribution of the same characteristics within a given patent population. For example, a first population of patents having a known relatively high intrinsic value or quality (e.g. successfully litigated patents) is compared to a second population of patents having a known relatively low intrinsic value or quality (e.g. unsuccessfully litigated patents). Based on a statistical comparison of the two populations, certain characteristics are identified as being more prevalent or more pronounced in one population group or the other to a statistically significant degree. Multiple such statistical comparisons are used to construct and optimize a computer model or computer algorithm that can then be used to accurately predict and/or provide statistically-accurate probabilities of a desired value or quality being present or a future event occurring, given the identified characteristics of an individual patent or group of patents.

The algorithm may comprise a simple scoring and weighting system which assigns scores and relative weightings to individual identified characteristics of a patent or group of patents determined to have statistical significance. For example, positive scores would generally be applied to those patent characteristics having desirable influence and negative scores would apply to those patent characteristics having undesirable influence on the particular quality or event of interest. A high-speed computer is then used to repeatedly test the algorithm against one or more known patent populations (e.g., patents declared to be valid/invalid or infringed/non-infringed). During and/or following each such test the algorithm is refined by adjusting the scorings and/or weightings until the predictive accuracy of the algorithm is optimized. Once the algorithm is suitably optimized, selected metrics for an individual indentified patent or group of patents to be rated are input into the algorithm and the algorithm is operated to calculate an estimated rating or mathematical score for that patent or group of patents. Individual results could be reported as statistical probabilities of a desired quality being present, or a future event occurring (patent being litigated, abandoned, reissued, etc.) over a specified period in the future. Results could also be provided as arbitrary raw scores representing the sum of an individual patent's weighted scores, which raw scores can be further ranked and reported on a percentile basis within a given patent population and/or upon any other comparative or non-comparative basis as desired.

The first and second patent populations selected for analysis are preferably roughly the same size and may comprise essentially any two groups of patents (or identifiable subsets of a single group of patents) having different actual or assumed intrinsic values or other qualities of interest. For example, the first population may consist of a random sample of 500–1000 patents that have been successfully litigated (found valid and infringed) and the second population may consist of a random sample of 500–1000 patents that have been unsuccessfully litigated (found either invalid or not infringed). Alternatively, the first population may consist of a random sample of patents that have been litigated and found valid regardless of whether infringement is also found, and the second population may consist of a random sample of patents that have been found invalid. Likewise, the first population may consist of a random

sample of patents that have been litigated and found infringed regardless of the validity finding and the second population may consist of a random sample of patents that have been found not infringed.

The selection of which study population(s) to use depends upon the focus of the statistical inquiry and the desired quality (e.g., claim scope, validity, enforceability, etc.) of the patent asset desired to be elicited. For example, if validity is the quality of interest, then the first and second patent populations may preferably be selected such that one population is known or predicted to have a higher incidence of invalid patents than the other population. This information may be readily gathered from published patent decisions of the Federal Circuit and/or the various federal district courts. Thus, the first population may consist of a random sample of patents declared invalid by a federal court and the second population may consist of a random sample of patents from the general patent population, which are presumed to be valid. Alternatively, the second population may consist of a random sample of patents declared "not invalid" by a federal court following a validity challenge.

The approach is not limited, however, to analyzing litigated patents. For example, fruitful comparisons may also be made between litigated patents (presumably the most valuable patents) and non-litigated patents; or between high-royalty-bearing patents and low-royalty-bearing patents; or between high-cost-basis patents and low-cost-basis patents; or between published patent applications and issued patents. The number and variety of definable patent populations having different desired qualities or characteristics capable of fruitful comparison in accordance with the invention herein is virtually unlimited. While not specifically discussed herein, those skilled in the art will also recognize that a similar approach may also be used for valuing and/or rating other intellectual property or intangible assets such as trademarks, copyrights, domain names, web sites, and the like.

In accordance with another embodiment the invention provides a method for rating or ranking patents. In accordance with the method, a first population of patents is selected having a first quality or characteristic and a second population of patents is selected having a second quality or characteristic that is different from the first quality or characteristic. Statistical analysis is performed to determine or identify one or more patent metrics having either a positive or negative correlation with either said first or second quality to a statistically significant degree. A regression model is constructed using the identified patent metric(s). The regression model is iteratively adjusted to be generally predictive of either the first or second quality being present in a given patent. The regression model is used to automatically rate or rank patents by positively weighting or scoring patents having the positively correlated patent metrics and negatively weighting or scoring patents having the negatively correlated patent metrics ("positive" and "negative" being used here in the relative sense only). If desired, the method may be used to generate a patent rating report including basic information identifying a particular reported patent or patents of interest and one or more ratings or rankings determined in accordance with the method described above.

In accordance with another embodiment the invention provides a statistical method for scoring or rating selected qualities of individual patents and for generating a rating report specific to each individual patent rated. The method begins by providing a first database of selected patent information identifying and/or quantifying certain selected characteristics of individual patents from a first population of patents having a selected patent quality of interest. A second database (or identified subset of the first database) of selected patent information is also provided identifying and/or quantifying certain selected characteristics of individual patents from a second population of patents generally lacking or having reduced incidence of the selected patent quality of interest. Statistical analysis is performed to identify one or more characteristics that are statistically more prevalent or more pronounced in either the first or second patent population to a statistically significant degree. Based on this information and the identified characteristics, individual patents may be scored or rated by positively weighting those having the same or similar characteristics and negatively weighting those lacking the same or similar characteristics. If desired, the method may be used to generate a patent rating report including basic information identifying a particular reported patent or patents of interest and one or more ratings or rankings determined in accordance with the method described above.

In accordance with another embodiment the invention provides a method and automated system for rating or ranking patents or other intangible assets. In accordance with the method a first population of patents is selected having a first quality or characteristic and a second population of patents is selected having a second quality or characteristic that is different from or believed to be different from the first quality or characteristic. A computer accessible database is provided and is programmed to contain selected patent metrics representative of or describing particular corresponding characteristics observed for each patent in the first and second patent populations. A computer regression model is constructed and adjusted based on the selected patent metrics. The regression model is operable to input the selected patent metrics for each patent in the first and second patent populations and to output a corresponding rating or ranking that is generally predictive of the first and/or second quality being present in each patent in the first and second patent populations. The regression model may then be used to rate or rank one or more patents in a third patent population by inputting into the regression model selected patent metrics representative of or describing corresponding characteristics of one or more patents in the third population.

In accordance with another embodiment the invention provides a high-speed method for automatically scoring or rating a sequential series of newly issued patents as periodically published by the PTO and for determining and storing certain rating or scoring information specific to each patent. According to the method, a substantial full-text copy of each patent in the sequential series is obtained in a computer text file format or similar computer-accessible format. A computer program is caused to automatically access and read each computer text file and to extract therefrom certain selected patent metrics representative of or describing particular observed characteristics or metrics of each patent in the sequential series. The extracted patent metrics are input into a computer algorithm. The algorithm is selected and adjusted to produce a corresponding rating output or mathematical score that is generally predictive of a particular patent quality of interest and/or the probability of a particular future event occurring. Preferably, for each patent in the sequential series the rating output or mathematical score is stored in a computer accessible storage device in association with other selected information identifying each rated patent such that the corresponding rating or score may be readily retrieved for each patent in the sequential series.

In accordance with another embodiment the invention provides a method for valuing individual selected patents. A

patent value distribution curve and/or data representative thereof is provided. The shape of the curve generally represents an estimated distribution of patent value according to percentile rankings within a predetermined patent population. The area under the curve is generally proportional to the total approximated value of all patents in the predetermined patent population. Individual selected patents from the population are ranked in accordance with selected patent metrics to determine an overall patent quality rating and ranking for each individual selected patent. The patent value distribution curve is then used to determine a corresponding estimated value for an individual selected patent in accordance with its overall patent quality ranking. If desired, the method may be used to generate a patent valuation report including basic information identifying a particular reported patent or patents of interest and one or more valuations determined in accordance with the method described above.

In accordance with another embodiment, the invention provides an automated method for scoring or rating patents in accordance with user-defined patent metrics and/or patent populations. The automated method is initiated by a user selecting a patent, or group of patents, to be rated. A full-text computer accessible file of the patent to be rated is retrieved from a central database, such as that currently maintained by the U.S. Patent & Trademark Office at www.uspto.gov. A computer algorithm evaluates the full-text file of the patent to be rated and extracts certain selected patent metric(s), which may be predefined, user-defined, or both. Based on the selected patent metric(s), the algorithm computes a rating number or probability (e.g., between 0 and 1) corresponding to the likely presence or absence of one or more user-defined qualities of interest in the patent to be rated and/or the probability of one or more possible future events occurring relative to the patent. If desired, the rating number or probability can be further ranked against other similar ratings for patents within a selected patent population, which may be predetermined, user-defined, or both. Thus, the method in accordance with the preferred embodiment of the invention is capable of producing multiple independent ratings and/or rankings for a desired patent to be rated, each tailored to a different user-defined inquiry, such as likelihood of the patent being litigated in the future, being held invalid, likelihood of successful infringement litigation, predicted life span of the patent, relative value of the patent, etc.

For purposes of summarizing the invention and the advantages achieved over the prior art, certain objects and advantages of the invention have been described herein above. Of course, it is to be understood that not necessarily all such objects or advantages may be achieved in accordance with any particular embodiment of the invention. Thus, for example, those skilled in the art will recognize that the invention may be embodied or carried out in a manner that achieves or optimizes one advantage or group of advantages as taught herein without necessarily achieving other objects or advantages as may be taught or suggested herein.

All of these embodiments and obvious variations thereof are intended to be within the scope of the invention herein disclosed. These and other embodiments of the present invention will become readily apparent to those skilled in the art from the following detailed description of the preferred embodiments having reference to the attached figures, the invention not being limited to any particular preferred embodiment(s) disclosed.

BRIEF DESCRIPTION OF THE FIGURES

Having thus summarized the overall general nature of the invention and its features and advantages, certain preferred embodiments and examples will now be described in detail having reference to the figures that follow, of which:

FIG. **1** is a simplified schematic system block-diagram illustrating one possible embodiment of a patent rating method and system having features and advantages in accordance with the present invention;

FIG. **2** is a simplified schematic flow chart of one possible multiple regression technique suitable for carrying out the rating method and system of FIG. **1**;

FIG. **3** is a graph of percentages of litigated patents according to age, illustrating the declining incidence of patent litigation with patent age;

FIG. **4** is a graph of percentages of litigated patents found to be infringed by a federal district court according to the average number of words per independent claim, illustrating the declining incidence of patent infringement with length of patent claim;

FIG. **5** is a graph of litigated patents according to technical field, illustrating the incidence of patent infringement holdings by field;

FIG. **6** is a graph of litigated patents according to technical field, illustrating the incidence of patent invalidity holdings by field;

FIG. **7** is a graph of percentages of litigated patents found to be invalid by a federal district court according to the average age of cited U.S. patent references, illustrating the declining incidence of patent invalidity with citation age;

FIG. **8** is a graph of overall patent maintenance rates for patents in the general patent population, illustrating increasing rates of patent mortality with age;

FIG. **9** is a graph of patent mortality rates for patents having different numbers of claims, illustrating decreasing mortality rates with increasing number of claims;

FIG. **10** is a graph of patent mortality rates for patents having different numbers of figures, illustrating decreasing mortality rates with increasing number of figures;

FIG. **11** is one possible preferred embodiment of a patent rating report generated in accordance with the method and system of FIG. **1** and having features and advantages of the present invention; and

FIG. **12** is one possible example of a patent value distribution curve for use in accordance with one embodiment of a patent valuation method of present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The utility of the present invention begins with the fundamental observation that not all intellectual property assets are created equal. In the case of patent assets, for example, two patents even in the same industry and relating to the same subject matter can command drastically different royalty rates in a free market, depending upon a variety of factors. These factors may include, for example: (1) the premium or incremental cost consumers are willing to pay for products or services embodying the patented technology; (2) the economic life of the patented technology and /or products; (3) the cost and availability of competing substitute technology and/or products; and (4) the quality of the underlying patent asset.

The quality of a patent in terms of the breadth or scope of rights secured, its defensibility against validity challenges and its commercial relevance can have particularly dramatic impact on its value. Obviously, a patent that has a very narrow scope of protection or that is indefensible against a

validity challenge will have much less value than a patent that has a broad scope of protection and strong defensibility. A skilled patent lawyer can examine the claims and specification of a patent, its prosecution history and cited prior art and, based on a detailed legal analysis, render a subjective opinion as to the likely scope and defensibility of the patent. However, such legal work is time-intensive and expensive. Thus, it may not be economically feasible to consult with a patent lawyer in every situation where such information may be desired.

The patent rating method and system of the present invention is not proposed to replace conventional legal analysis or traditional valuation methods, but to complement and support the overall evaluative process. In one embodiment, the present invention provides an objective, statistical-based rating method and system for substantially independently assessing the relative breadth ("B"), defensibility ("D") and commercial relevance ("R") of individual patent assets and other intangible intellectual property assets. Thus, the invention can provide new and valuable information which can be used by patent valuation experts, investment advisors, economists and others to help guide future patent investment decisions, licensing programs, patent appraisals, tax valuations, transfer pricing, economic forecasting and planning, and even mediation and/or settlement of patent litigation lawsuits. Such information may include, for example and without limitation: statistically calculated probabilities of particular desired or undesired qualities being present; statistical probabilities of certain future events occurring relative to the asset in question; ratings or rankings of individual patents or patent portfolios; ratings or rankings of patent portfolios held by public corporations; ratings or rankings of patent portfolios held by pre-IPO companies; ratings or rankings of individual named inventors; and ratings or rankings of professional service firms, law firms and the like who prepare, prosecute and enforce patents or other intellectual property assets.

In its simplest form the present invention provides a statistical patent rating method and system for rating or ranking patents based on certain selected patent characteristics or "patent metrics." Such patent metrics may include any number of quantifiable parameters that directly or indirectly measure or report a quality or characteristic of a patent. Direct patent metrics measure or report those characteristics of a patent that are revealed by the patent itself, including its basic disclosure, drawings and claims, as well as the PTO record or file history relating to the patent. Specific patent metrics may include, for example and without limitation, the number of claims, number of words per claim, number of different words per claim, word density (e.g., different-words/total-words), length of patent specification, number of drawings or figures, number of cited prior art references, age of cited prior art references, number of subsequent citations received, subject matter classification and sub-classification, origin of the patent (foreign vs. domestic), payment of maintenance fees, prosecuting attorney or firm, patent examiner, examination art group, length of pendency in the PTO, claim type (i.e. method, apparatus, system), etc.

Indirect patent metrics measure or report a quality or characteristic of a patent that, while perhaps not directly revealed by the patent itself or the PTO records relating to the patent, can be determined or derived from such information (and/or other information sources) using a variety of algorithms or statistical methods including, but not limited to, the methods disclosed herein. Examples of indirect patent metrics include reported patent litigation results, published case opinions, patent licenses, marking of patented products, and the like. Indirect patent metrics may also include derived measures or measurement components such as frequency or infrequency of certain word usage relative to the general patent population or relative to a defined sub-population of patents in the same general field.

For example, each word and/or word phrase in a patent claim (and/or patent specification) could be assigned a point value according to its frequency of use in a randomly selected population of similar patents in the same general field. Statistically common words or word phrases such as simple articles, pronouns and the like could receive relatively low point values. Uncommon words or word phrases could receive relatively high point values. The total point score for each claim could then be taken as an indication of its relative breadth or narrowness based on the total number and statistical prevalence of each of the words contained in the claim. Optionally, different amounts of points can be accorded to claim words or word phrases based on whether or not they also appear in the patent specification. Multiple claims and/or patents could also be combined into a single analysis, if desired.

In accordance with one preferred embodiment of the invention relative ratings or rankings are generated using a database of selected patent information by identifying and comparing various relevant characteristics or metrics of individual patents contained in the database. In one example, a first population of patents having a known or assumed relatively high intrinsic value (e.g. successfully litigated patents) are compared to a second population of patents having a known or assumed relatively low intrinsic value (e.g. unsuccessfully litigated patents). Based on the comparison, certain characteristics are identified as statistically more prevalent or more pronounced in one population group or the other to a significant degree.

These statistical comparisons are then used to construct and optimize a computer model or computer algorithm comprising a series of operative rules and/or mathematical equations. The algorithm is used to predict and/or provide statistically determined probabilities of a desired value or quality being present and/or of a future event occurring, given the identified characteristics of an individual identified patent or group of patents. The algorithm may comprise a simple scoring and weighting system which assigns scores and relative weightings to individual identified characteristics of a patent or group of patents determined (or assumed) to have statistical significance. For example, positive scores could generally be applied to those patent characteristics determined or believed to have desirable influence and negative scores could be applied to those patent characteristics determined or assumed to have undesirable influence on the particular quality or event of interest.

Once the basic algorithm is constructed, a high-speed computer is preferably used to repeatedly test the algorithm against one or more known patent populations (e.g. patents declared to be valid/invalid or infringed/non-infringed). During and/or following each such test the algorithm is refined (preferably automatically) by iteratively adjusting the scorings and/or weightings assigned until the predictive accuracy of the algorithm is optimized. Adjustments can be made automatically in an orderly convergence progression, and/or they can by made randomly or semi-randomly. The latter method is particularly preferred where there are any non-linearities in the equations or rules governing the algorithm. Algorithm results are preferably reported as statistical probabilities of a desired quality being present, or a future event occurring (e.g., patent being litigated, abandoned,

reissued, etc.) during a specified period in the future. Algorithm results could also be provided as arbitrary raw scores representing the sum of an individual patent's weighted scores, which raw scores can be further ranked and reported on a percentile basis or other similar basis as desired. Preferably, the statistical accuracy of the algorithm is tracked and reported over time and periodic refinements are made as more and more data is collected and analyzed.

System Architecture

FIG. 1 is a simplified block diagram of one possible embodiment of a patent rating method and automated system **100** having features and advantages in accordance with the present invention. The system is initiated at the START block **110**. At block **120** certain characteristics C_a of Patent Population "A" are inputted from a database **125** in the form:

$$C_a=\{A_1, A_2 \ldots A_n\}$$

where:

C_a=set of selected characteristics of Pat. Pop. "A"

A_n=an individual selected characteristic of Pat. Pop. "A"

At block **130** characteristics C_b of Patent Population "B" are inputted from a database **135** in the form:

$$C_b=\{B_1, B_2 \ldots B_n\}$$

where:

C_b=set of selected characteristics of Pat. Pop. "B"

B_n=an individual selected characteristic of Pat. Pop. "B"

Preferably, Patent Population "A" and Patent Population "B" are selected to have different known or assumed intrinsic values and/or qualities such that a fruitful comparison may be made. For example, Population "A" may comprise a random or semi-random (e.g., representative) sample of successfully litigated patents and/or individual patent claims. Population "B" may comprise a random or semi-random sample of unsuccessfully litigated patents and/or individual patent claims. In that case, Population "A" patents/claims may be assumed to have higher intrinsic value than Population "B" patents/claims. Alternatively, and regardless of whatever assumed or intrinsic economic value the patents may have, Population "A" patents may be described as having the quality of being successfully litigated (infringement or validity), whilst Population "B" patents may be described as having the quality of being unsuccessfully litigated (infringement or validity). Thus, by examining and comparing the characteristics of litigated patents/claims that fall into either population "A" or "B", one can make certain statistical conclusions and predictions about other patents that may or may not have been litigated. Such probabilistic analysis can also be easily extended to accurately calculate the odds, for example, of prevailing on a particular patent infringement claim or defense in a particular litigation proceeding (e.g., preliminary injunction motion, summary judgement motion, jury trial, bench trial, appeal, etc.). Such information would be of tremendous value to patent litigants, for example.

Of course, the study populations are not limited to litigated patents/claims. For example, one study population may comprise a random or semi-random sample of patents selected from the general patent population and having a representative "average"value or quality. The other study population may comprise, for example and without limitation, a random or semi-random sample of patents selected from a sub-population consisting of all patents for which 1st, 2nd or 3rd maintenance fees have been paid; or all patents that have been licensed for more than a predetermined royalty rate; or all patents that have been successfully reissued/reexamined; or all patents that have related counterpart foreign patents; or all patents that have been subsequently cited by other patents at least X times; etc. The number and variety of possible ways to define study populations of interest in accordance with the invention are virtually limitless.

Next, at block **140** a comparison is made between the selected characteristics C_a of Patent Population "A" and the same selected characteristics C_b of Patent Population "B". Based on the comparison, certain characteristics are identified at block **144** as being statistically more prevalent or more pronounced in one population or the other to a significant degree. This comparison can be performed and the statistical significance of observed differences determined by applying known statistical techniques. Thus, certain statistically relevant characteristics of each study population can be readily identified and described mathematically and/or probabilistically.

At block **148** a multiple regression model is constructed using the identified statistically relevant characteristics determined at block **144**. Multiple regression modeling is a well-known statistical technique for examining the relationship between two or more predictor variables (PVs) and a criterion variable (CV). In the case of the present invention the predictor variables (or independent variables) describe or quantify the selected relevant characteristics of a particular patent population, e.g., class/sub-class, number of independent claims, number of patent citations, length of specification, etc. Criterion variables (or dependent variables) measure a selected quality of a particular patent population, such as likelihood of successful litigation (either validity or infringement). Multiple regression modeling allows the criterion variable to be studied as a function of the predictor variables in order to determine a relationship between selected variables. This data, in turn, can be used to predict the presence or absence of the selected quality in other patents. The regression model has the form:

$$CV_m=f\{PV_1, PV_2 \ldots PV_n\}$$

where:

CV_m=criterion variable (e.g., quality desired to be predicted)

PV_n=predictor variable (e.g., statistically relevant characteristic)

Once the regression model is completed it can be applied at block **150** to predict the presence or absence of the selected quality in other patents selected from Patent Population "C", for example, which may be the same as or different from Populations "A" or "B." Characteristics C_c of each individual patent P_n to be analyzed are inputted at block **150** from a database **155** in the form:

$$C_c=\{C_1, C_2 \ldots C_n\}$$

where:

C_c=set of selected characteristics of a patent P_n

C_n=an individual selected characteristic of patent P_n

The relevant characteristics PV_n of patent P_n are identified and plugged into the regression model at block **160**. The resulting predicted value or score CV_m, representing the quality of interest for patent P_n, is then outputted to a data output file **178**, printer or other output device, as desired. The system terminates at STOP block **180**.

Statistical Methodology

Many different methods of statistical analysis may be suitably employed to practice the present invention. The

preferred methodology is a multiple regression technique performed, for example, by a high-speed computer. As noted above, multiple regression modeling is a statistical technique for examining the relationship between two or more predictor variables (PVs) and a criterion variable (CV). In the case of the present invention the predictor variables (or independent variables) describe or quantify certain observable characteristics of a particular patent population, e.g., number of independent claims, length of specification, etc. Criterion variables (or dependent variables) measure a selected quality of interest of a particular patent population, such as likelihood of successful litigation, validity or infringement. Multiple regression modeling allows the criterion variable to be studied as a function of the predictor variables in order to determine a relationship between selected variables. This data, in turn, can be used to predict the presence or absence of the selected quality in other patents.

For example, if one were interested in examining the relationship between the number of times the word "means" is used in a claim (the PV) and a finding of infringement in litigation (the CV), one could use the following simple linear regression model:

$$Y=a+bXi$$

Where:

Y=criterion variable (likelihood of patent infringement)

Xi=predictor variable (number of times "means" appears)

a=the Y-intercept (% found infringed where Xi=0)

b=the rate of change in Y given one unit change in Xi

The coefficients a, b can be determined by iteration or other means so that the sum of squared errors is minimized in accordance with the well-known ordinary least squares (OLS) technique. Given least squares fit, the mean of the errors will be zero.

The above example is a single-variable, linear regression model. In carrying out the present invention, those skilled in the art will readily appreciate that it may be desirable to include a number of different predictor variables (PVs) in the regression model (expressed either as linear or non-linear functions and/or rules) in order to extract useful information from available patent data. FIG. **2** is a simplified schematic flow chart **200** of one such suitable multiple regression technique that may be employed in carrying out the present invention.

The flow chart begins at the START block **202**. At block **204** certain system variables are initialized. These include multi-regression coefficients a, b, c and d, incremental step changes Δa, Δb, Δc and Δd for each coefficient a, b, c and d, respectively, and various counters CO (#correct predictions), IN (# incorrect predictions), n (# patent in population) and m (loop repeat count). At step **206** the system inputs selected characteristics ($C_n=X_1, X_2, X_3$) of the next patent (n) in the study population (e.g., litigated patents). Preferably, the characteristics X_1, X_2, X_3 have been previously selected and determined to have a statistically significant impact on the selected patent quality desired to be measured. At step **208** the observed patent quality Y of patent n is inputted into the system. In this case, the patent quality of interest is the validity or invalidity of the patent as determined by a final judgement of a court. Alternatively, the measured patent quality could be any one or more of a number of other qualities of interest such as discussed above.

At step **210** the system calculates a predicted patent quality such as the probability that the patent in question is valid P(valid). In this case, a simple linear multi-regression model is chosen having the form:

$$P(\text{valid})=a+bX_1+cX_2+dX_3$$

where:

P(valid)=predicted probability of patent validity

X_1, X_2, X_3 are various predictor variables

a=Y-intercept (% found valid where $X_1, X_2, X_3=0$)

b,c,d=rate of change in P(valid) per unit change of X_1, X_2, X_3

Once the probability of validity is calculated, the system at step **212** determines an expected quality Y' based on the probability P(valid). In particular, if P(valid) is calculated to be greater than 0.5 (>50%) then the expected outcome Y' is that the patent is "VALID" as indicated by block **214**. If P(valid) is calculated to be less than 0.5 (<50%) then the expected outcome Y' is that the patent is "INVALID" as indicated by block **216**.

The expected patent quality or outcome Y' is then compared to the actual observed patent quality Y at step **220** and a determination is made whether Y=Y' indicating a correct prediction (block **218**) or whether Y<>Y' indicating an incorrect prediction (block **222**). In the case of a correct prediction the counter CO is incremented. In the event of an incorrect prediction, the counter IN is incremented. If patent (n) is not the last patent in the study population, then decision bock **226** directs the system to loop back again repeating the above steps **206–226** for the next patent n=n+1 in the population and incrementing the patent counter n at block **224**. If patent(n) is the last patent in the population (n=#pop) then decision block **226** directs the system to begin a statistical analysis of the regression model.

This analysis begins at block **228** wherein the statistical accuracy (SA) of the model (m) is calculated using the equation:

$$SA(m)=CO/(CO+IN)$$

where:

SA(m)=statistical accuracy of regression model (m)

CO=number of correct predictions for model (m)

IN=number of incorrect predictions for model (m)

The statistical accuracy SA(m) is a simple and easily calculated measure of how much observed data was accurately accounted for (i.e. correctly predicted) by the regression model (m). This is a very basic measure of the predictive accuracy of the regression model and is described herein by way of example only. If desired, a more sophisticated approach, such as variance analysis, could also be used to accurately measure the predictive power of a given regression model (m).

Variance analysis measures the variance in the criterion variable (e.g., Y') as a function of each of the predictor variables (e.g., X_1, X_2, X_3). The measured variance in the criterion variable (Y') can be broken into two parts: that predicted by one or more of the selected predictor variables and that variance not predicted by the selected predictor variables. The latter is often referred to as "error variance." The total predicted variance is the amount of variance accounted for by the regression model. For instance, if the predicted variance is 0.78 —this means the regression model is accounting for 78% of the possible variance. Of course, it is important and desirable to account for as much variance as possible with a given regression model. The more variance one can account for, the more confidence one has about the predictions made by the regression model.

Predicted variance can also be increased by adding more predictor variables to the regression model. But, as the number of predictor variables in the regression model increases beyond a certain point there is a risk that the predicted variance may become artificially inflated, indicating that the model is purporting to account for variance that is not actually accounted for in the population. This problem may be controlled by selecting an appropriate number of predictor variables in a given model in accordance with the number of samples in the population. Preferably, the number of predictor variables is no more than about 5–10% of the total number of samples in a given population and is most preferably less than about 1–3% of the total population. Thus, for a patent population size of 1,000, preferably the number of predictor variables is no more than about 50–100 and most preferably no more than about 10 to 30 total, or between about 15–25. Alternatively, where it is desirable to use more predictor variables in a given regression model, an adjusted predicted variance may be calculated using well-known techniques which take into account both the number of predictor variables and the sample size.

Decision block **230** compares the calculated statistical accuracy SA(m) of the current regression model (m) to the statistical accuracy SA(m−1) of the previous regression model (m−1). If the statistical accuracy SA(m) indicates improvement, then decision block **230** directs the system to coefficient adjustment block **227**. This block increments or decrements one or more of the coefficients (a, b, c and d) by a predetermined amount (Δa, Δb, Δc and Δd). The adjustment amounts (+ or −) are periodically determined by the system **200** to accurately converge the regression model toward maximum statistical accuracy SA. This may be done in a variety of ways. One simple convergence technique is described below.

If decision block **230** determines that SA(m)<SA(m−1), this indicates that the current regression model (m) is a worse predictor of the desired patent quality than the previous regression model (m−1). Therefore, a different adjustment is needed to be made to the coefficients a, b, c, and/or d in order to cause the system to reconverge toward the optimal solution providing for maximum predictive accuracy. This is done by directing the system to blocks **232–268** to test the impact of various changes to each predictor variable (a, b, c, d) and to change one or more of the coefficient adjustment amounts (Δa, Δb, Δc and Δd) as necessary to reconverge on the optimal solution.

Preferably, course adjustments are made first and then finer and finer adjustments are continually made as the regression model converges on an optimal solution having maximized statistical accuracy SA. Thus, decision blocks **232, 242, 252** and **262** first preferably determine which of the adjustment amounts (Δa, Δb, Δc and Δd) is greatest in magnitude. For example, if it is determined that Aa is greater than each of the adjustment amounts Δb, Δc and Δd, then decision block **232** directs the system to block **234**.

Block **234** tests a modified regression model (m−1) where a=a−Δa/2. If the modified regression model results in improved statistical accuracy such that:

$$SA(\text{TEST})>SA(m-1)$$

then decision block **236** directs the system to block **238**. Block **238** inverts and reduces the adjustment amount Δa=−(Δa/2) and reinitializes the counts CO and IN to zero. Block **240** reinitializes the patent count to n=1. The system then resumes normal operation starting at block **206**.

If the modified regression model does not result in improved statistical accuracy, decision block **236** directs the system to the next decision block **242** to determine whether an adjustment to one of the other coefficients might improve the accuracy of the regression model. The process of adjusting the coefficients and testing the accuracy of a new adjusted regression model repeats until decision block **262** determines that the system has cycled through a predetermined number of models, in this case m=1000. At this point the system stops at END block **270**, whereby the data may be extracted and studied or used to provide quality ratings or rankings of patents outside (or inside) the study populations as described above. If there are any non-linear relationships between the criterion variable and any predictor variable(s), it is preferred to randomize the variable coefficients at least periodically and reconverge toward an optimal solution in order to fully explore all possible optimal solutions.

Multiple regression modeling, as described above in connection with FIG. **2**, is particularly well suited to carrying out the rating methods of the present invention. The methodology allows one not only to determine a statistical relationship between a criterion variable (CV) of interest and a number of predictor variables (PVs), it also allows one to determine the independent contributions of each predictor variable in the model by allowing for partitioning of variance. In other words, one can determine how much variance in the criterion variable is accounted for by a specific predictor variable. This can be accomplished, for example, by removing the PV in question from the model and then determining if the correlation predicted by the model significantly declines when the predictor variable is removed from the equation and the other predictor variables remain.

Partitioning of variance is also useful in detecting possible collinearity or multi-collinearity between two of more predictor variables. Collinearity occurs when all or most of the variance in one predictor variable is accounted for by one other predictor variable. Multi-collinearity exists when several predictor variables combined account for all or most of the variance of another predictor variable. While not directly detrimental to the utility of the invention, collinearity or multi-collinearity can create problems where it is desired to accurately determine the slope or direction of an individual regression line for a particular predictor variable. Collinearity or multi-collinearity can be reduced or eliminated by removing superfluous predictor variables and/or by combining two or more predictor variables into a single normalized predictor variable.

EXAMPLE APPLICATIONS

Having thus described the preferred embodiments of the invention in detail those skilled in the art will recognize that the basic concepts and principles disclosed herein may be applied and implemented in a wide variety of useful ways to achieve desired results. A few examples are provided below by way of illustration in order to demonstrate the broader utility of the invention and how it may be used commercially.

Example 1

One possible application of the present invention is to identify and study relevant characteristics from a sample of litigated patents to determine and measure those patent metrics that are predictive of a possible future event, such as a patent being litigated. Patent litigation is the ultimate attestation of patent value. A patent plaintiff is faced with enormous legal costs to bring and prosecute a patent infringement action. Thus, the decision to invest such substantial sums to enforce a patent is potentially (although, not

neccessarily) a strong indicator of the strength and value of the underlying patent asset.

A study of statistical data representing about 1200 litigated patents reveals several interesting patterns which can help predict whether a particular patent will be litigated. One pattern that is immediately evident is that patents are typically litigated relatively early in their lives. FIG. **3** is a graph of the average age of a selected sample of litigated patents. This graph indicates that most patents (>50%) that are litigated are litigated within five years from the date of issuance. The decrease in the incidence of patent litigation with age suggests that patents may have a diminishing value over time. This is generally consistent with what one might expect as newer technology replaces older technology. Thus, using the graph of FIG. **3** and knowing the age of a particular patent(s) of interest (all other things being assumed equal), one can estimate the probability of the patent(s) being litigated within one year, two years, three years, etc., in the future.

Another interesting pattern is that foreign originating patents (i.e., patents claiming priority to a foreign parent application) are much less likely to be litigated than domestic originating patents. For example, a study of the relevant data reveals that 0.67% of all patents issued in 1990 were litigated, compared to 0.16% of foreign originating patents. Moreover the incidence of patent litigation varies significantly with country of origin. Only 0.10% of all Japanese originating patents issued in 1990 were litigated compared to 0.38% of U.K. originating patents and compared to 0.15% of German originating patents. These differences may reflect disparities in the relative costs of litigation for various foreign patentees as well as language and cultural differences.

Each of the patent metrics identified above is anticipated to have a statistically significant impact on the probability of a patent being litigated in the future. By undertaking a statistical study of these and other patent metrics and by constructing a suitable regression model in accordance with the invention disclosed herein, one can calculate an estimated statistical probability of a given patent being litigated during a predetermined period of time in the future based on the identified patent characteristics. If desired, a numerical rating or ranking may be assigned to each patent indicating the relative likelihood of litigation.

Example 2

Another possible application of the present invention is to identify and study relevant characteristics from a sample of litigated patents to determine and measure those patent metrics that are predictive of a particular desired outcome in litigation (e.g., a finding of infringement and/or invalidity).

For example, it is a commonly-held notion among patent professionals that certain claim language or claim limitations can have narrowing effects on the scope of patent claims. Claims that are very long and recite many detailed limitations or that recite limitations in the form of "means plus function" language and the like can significantly restrict the scope of patent claims. Therefore, it is anticipated that patent metrics reflecting such qualities (e.g., large number of words per claim, or large number of different words per claim, use of "means" language and the like) will have a statistically significant negative correlation with favorable litigation results.

Table 1 below, summarizes the incidence of final judgements of infringement for 665 reported patent infringement cases brought in the U.S. federal district courts between 1987 and 1998. The results are divided according to whether one or more of the asserted claim(s) contained a "means" limitation.

TABLE 1

Asserted Claim	% Infringed
"Means"	47.1
"Non-Means"	51.2

As indicated in Table 1, above, asserted patent claims that contained at least one "means" limitation were found to be infringed about 8.7% (4.1% in absolute percentage terms) less often than asserted patent claims that did not contain a means limitation. This supports the notion that "means" limitations have a narrowing effect on claim breadth.

Similarly, FIG. **4** is a graph **320** of percentages of litigated patents found to be infringed by a federal district court between 1987 and 1998, illustrating a statistical relationship between the incidence of infringement and the average number of words or "word count" per independent claim. The graph generally illustrates a declining incidence of patent infringement with increasing word count. Again, this supports the generally-held notion that longer claims are narrower than shorter claims. Of course, those skilled in the art will recognize that more sophisticated relationships could also be established and characterized statistically.

For example, a modified word count metric comprising only non-repeated words per claim could be used. Alternatively, each word and/or word phrase in a patent claim could be assigned a point value according to its frequency of use in a randomly selected population of similar patents in the same general field. Statistically common words or word phrases such as simple articles, pronouns and the like would receive relatively low point values. Uncommon words or word phrases would receive relatively high point values. The total point score for each claim would then be an indication of its relative readth or narrowness based on the total number and statistical prevalence of each of the words contained in the claim. Optionally, different amounts of points can be accorded to claim words or word phrases based on whether or not such words or word phrases also appear in the patent specification. Multiple claims and/or patents could also be combined into a single such analysis, if desired.

If multiple independent claims are being considered for each patent, it may be helpful to develop a "relatedness index" metric which characterizes the relatedness of each claim to one or more other claims of the patent (and/or one or more other patents). All other things being equal, it is expected that a patent having two or more claims that are highly related to one another (e.g., having substantially overlapping claim coverage) would be narrower in overall scope than a patent having two or more claims that are substantially dissimilar from one another (and, therefore, likely cover different subject matter). One convenient way to formulate a relatedness index is to compare the number of words that are common to each claim versus the number of words that are unique to each claim. For example, a first claim of interest (claim **1**) may contain 95% of the same words in common with a second claim of interest (claim **2**). Therefore, the two claims could be described as having a relatedness index ($R_{1,2}$) of 95% or 0.95. However, a third claim of interest (claim **3**) may contain only 45% of the same words in common with the first claim (claim **1**). Therefore, these two claims could be described as having a relatedness

index ($R_{1,3}$) of 45% or 0.45. More sophisticated approaches could further weight or score each word in accordance with frequency of use as described above, and/or could provide for matching of similar or synonymous words. A relatedness index metric could also be developed and used to compare the relatedness or apparent relatedness of one or more patent specifications. This could be useful, for example, in identifying related or similar patents within a portfolio.

FIG. **5** is a graph **340** of litigated patents according to technical field, illustrating the incidence of patent infringement holdings by field. Similarly, FIG. **6** is a graph **360** of litigated patents according to technical field, illustrating the incidence of patent invalidity holdings by field. In each case, the numbers above each bar indicate the sample size of each patent population reported. Each of these graphs illustrates a statistical relationship between the general technical field of an invention and the incidence of validity or infringement holdings in litigation.

FIG. **7** is a graph **380** of percentages of litigated patents found to be invalid by a federal district court according to the average age of U.S. patent references cited therein. In particular, the graph **380** illustrates a declining incidence of patent invalidity with citation age. Curve **390** is a representative trend line having the general equation:

$$Y=mX+B$$

where:

Y=Y-coordinate value (% infringement)

X=X-coordinate value (avg. age cited refs. in years)

m=slope of line (% infringement/#years)

b=Y-axis intercept

The slope (m) and Y-axis intercept (b) of curve **390** were determined by trial and error to produce an ordinary least squares fit to the data reported by graph **380**. Thus, the curve **390** (and the resulting formula thereof) is generally representative of the statistical relationship between average citation age and incidence of patent validity in litigation.

In each of the cases described above, the identified patent metrics are anticipated to have a statistically significant impact on the probability of a patent being litigated successfully or unsuccessfully. By undertaking a statistical study of these and other identified patent metrics and by constructing a suitable regression model in accordance with the invention disclosed herein, one can accurately calculate an estimated statistical probability of a given patent being successfully litigated (found valid and/or infringed), taking into consideration all of the identified patent characteristics and statistical relationships simultaneously. If desired, a numerical rating or ranking may be automatically calculated and assigned to each patent indicating the relative likelihood of a particular event or quality. Such rating may be provided for the patent as a whole or, alternatively (or in addition), individual ratings may be provided for one or more individual claims of the patent, as desired.

Example 3

In the United States and most foreign countries, patentees are required to pay periodic maintenance fees during the term of a patent to maintain the patent in force. In most countries, these consist of fixed annual fees of $200–300 per year paid to the government patent office to maintain a patent in force. In the United States, maintenance fees are paid every four years and escalate progressively from $525/$1,050 to maintain a patent in force beyond the fourth year, to $1,050/$2,100 to maintain a patent in force beyond the eighth year, to $1,580/$3,160 to maintain a patent in force beyond the twelfth year. Patentees that qualify as a "small entity" pay the smaller amounts; all others pay the larger amounts.

The relatively substantial and escalating nature of these periodic maintenance fee payments has the effect of discouraging the maintenance for the full-term of all but the most successful or valuable patents. Thus, such patent maintenance fee data provides a unique, introspective look at how patentees themselves value their own patents. A reasonable and economically motivated patentee would not pay to maintain his or her patent if the cost of the maintenance fee exceeded the reasonable expected future benefit likely to be gained by maintaining the patent in force for an additional four year period. Thus, PTO records reflecting the payment or non-payment of periodic maintenance fees by patentees provides a wealth of data from which a wide variety of useful information may be derived. Such information is useful, for example, for purposes of conducting patent valuations, patent rankings, patent ratings, and/or for other purposes as generally taught herein.

Thus, another possible application of the present invention is to identify and study relevant characteristics of a sample population of 20,000–80,000 patents that have been maintained beyond the first, second or third maintenance periods as against a sample population of 20,000–80,000 patents that have not been maintained or are abandoned prior to the expiration of their statutory term. In this manner, one may determine and measure with a high-level of statistical accuracy (i.e., greater than 95% confidence) those patent metrics that are predictive of patents being abandoned prior to expiration of their full term. Moreover, one may determine with a similar degree of statistical accuracy the particular relationship or contribution provided by one or more individual patent metrics of interest. This may be accomplished, for example, using variance partitioning and/or other similar statistical analysis techniques.

In this case, a study of the statistical data reveals several interesting patterns that may help predict whether a particular patent will be abandoned or maintained beyond its first, second or third maintenance period. FIG. **8** is a graph of patent maintenance rates for a random sample population of patents issued in 1986. This graph **400** indicates that approximately 83.5% of such patents were maintained beyond the fourth year, approximately 61.9% of the patents were maintained beyond the eighth year and approximately 42.5% of the patents were maintained beyond the twelfth year. In other words, all but about 42.5% of the sample population were abandoned or allowed to expire before the full statutory patent term. This corresponds to an overall average patent mortality (abandonment) rate of approximately 58.5%. From this and/or other similar data one can formulate certain general expectations or probabilities as to whether a patent will likely be maintained or abandoned in the future.

More specific expectations and probabilities can be formulated by identifying and/or measuring those specific patent metrics associated with patent populations having either high or low mortality rates. For example, the data reveals that Japanese originating patents generally have lower mortality rates than domestic originating patents (44.7% vs. 58.5%). The data also reveals that patents classified by the PTO in different classes and/or subclasses can have significantly different mortality rates. For example, Table 2 below illustrates various observed mortality rates for patents categorized in several selected PTO classes:

TABLE 2

CLASS	DESCRIPTION	MORTALITY
482	Exercise Equipment	79%
473	Golf Clubs/Equipment	74%
434	Golf Training Devices	71%
446	Toys and Amusement Devices	70%
206/250	Packaging	57%
365/364	Computers	45%
935	Genetic Engineering	44%

As Table 2 illustrates, patent mortality rates can vary dramatically depending upon the general subject matter of the patented invention as determined by the PTO classification system. Thus, one can reasonably conclude that, all other things being equal, certain classes of inventions are probably more valuable (more likely to be maintained) or less valuable (less likely to be maintained) than certain other classes of inventions. From this and/or other similar data one can formulate specific and/or more accurate expectations or probabilities as to whether a particular patent having certain identified characteristics will likely be maintained or abandoned in the future.

FIG. **9** illustrates a similar observed correlation between the number of claims contained in a patent and the patent mortality rate. In particular, for patents having five or fewer claims the average mortality rate is observed to be about 66.3%. However, for patents having greater than 25 claims the mortality rate is observed to drop to 49.3%. Again, this indicates that, all other things being equal, patents having more claims are probably more valuable (more likely to be maintained) than patents having less claims.

FIG. **10** illustrates another similar observed correlation between the number of figures or drawings contained in a patent and the patent mortality rate. In particular, for patents having five or fewer figures the average mortality rate is observed to be about 62.7%. However, for patents having greater than 25 figures the mortality rate is observed to drop to 46.6%. Again, this indicates that, all other things being equal, patents having more figures (and presumably more disclosure) are probably more valuable (more likely to be maintained) than patents having less figures.

At least one study has reported that the number of citations subsequently received by a patent ("forward" citations) may also have a positive correlation with economic value. Sees e.g., Harhoff et al., "Citation Frequency and the Value of Patented Innovation, ZEW Discussion Paper No. 97–27(1997). Assuming this is true, one would expect to see a relatively low mortality rate for patents that receive an above-average number of forward citations and a relatively high mortality rate for patents that receive a below-average number of forward citations. This can be easily verified and statistically measured using the methods taught herein.

Each of the patent metrics identified above is anticipated to have a statistically significant impact on the probability of a patent being maintained or abandoned, litigated successfully or unsuccessfully, etc. By undertaking a statistical study of these and other patent metrics and by constructing a suitable regression model or algorithm in accordance with the invention disclosed herein, one can calculate with a statistically determined accuracy an estimated probability of a particular patent quality or a particular event occurring affecting a given patent. If desired, a numerical rating or ranking may be assigned to each patent indicating its relative value or score. Multiple ratings or rankings may also be provided representing different qualities of interest or probabilities of articular future events occurring.

Patent Ratings, Valuations & Reports

Patent ratings or rankings as taught herein may be compiled and reported in a variety of suitable formats, including numerical ratings/rankings, alphanumeric ratings/rankings, percentile rankings, relative probabilities, absolute probabilities, and the like. Multiple ratings or rankings may also be provided corresponding to different patent qualities of interest or specific patent claims. FIG. **11** illustrates one possible form of a patent rating and valuation report **700** that may be generated in accordance with a preferred embodiment of the invention.

As illustrated in FIG. **11**, the report **700** contains some basic data **710** identifying the patent being reported, including the patent number, title of the invention, inventor(s), filing date, issue date and assignee (if any). Several individual patent ratings **720** are also provided, including overall patent breadth ("B"), defensibility ("D"), and commercial relevance ("R"). Breadth and Defensibility ratings are preferably generated by a computer algorithm that is selected and adjusted to be predictive of known litigation outcomes (e.g., infringement/non-infringement and validity/invalidity) of a selected population of litigated patents based on various comparative patent metrics. Relevance ratings are preferably generated using a computer algorithm selected and adjusted to be predictive of patent maintenance rates and/or mortality rates based on various comparative patent metrics including, preferably, at least one comparative metric based on a normalized forward patent citation rate (normalized according to patent age). If desired, each of the B/D/R ratings can be statistically adjusted relative to the remaining ratings using known statistical techniques so as to minimize any undesired collinearity or overlap in the reported ratings.

In the particular example illustrated, ratings **720** are provided on a scale from 1 to 10. However, a variety of other suitable rating scales may also be used with efficacy, such as numerical rankings, percentile rankings, alphanumeric ratings, absolute or relative probabilities and the like. If desired, individual ratings or rankings **720** may also be combined using a suitable weighting algorithm or the like to arrive at an overall score or rating **730** for a given patent, patent portfolio or other intellectual property asset. The particular weighting algorithm used would preferably be developed empirically or otherwise so as to provide useful and accurate overall patent rating information for a given application such as investment, licensing, litigation analysis, etc.

For investment purposes, for example, overall ratings may be provided in the form of convenient bond-style ratings as summarized in Table 3 below:

TABLE 3

Quality	Rating
Highest quality	AAA
High quality	AA
Medium-high quality	A
Upper medium quality	BBB
Medium quality	BB
Lower medium quality	B
Medium-low quality	CCC
Low quality	CC
Lowest quality	C

If desired, such overall ratings can be separately collected and tabulated for use as a handy reference source. For

example, overall patent ratings can be published and updated periodically for all patents currently in force and/or for all newly issued patents published by the PTO, providing simple and useful information to those who desire to use it. Such information could also advantageously be stored on a searchable database accessible through an Internet-based web server or the like.

To accomplish this purpose, the invention may be modified and adapted to provide high-speed, automated scoring or rating of a sequential series of newly issued patents periodically published by the PTO. According to the preferred method, a substantial full-text copy of each patent in the sequential series is obtained in a computer text file format or similar computer-accessible format. A computer program is caused to automatically access and read each computer text file and to extract therefrom certain selected patent metrics representative of or describing particular observed characteristics or metrics of each patent in the sequential series. The extracted patent metrics are input into a previously determined computer regression model or predictive algorithm that is selected and adjusted to calculate a corresponding rating output or mathematical score that is generally predictive of a particular patent quality of interest and/or the probability of a particular future event occurring. Preferably, for each patent in the sequential series a rating output or mathematical score is directly calculated from the extracted metrics using a series of predefined equations, formulas and/or rules comprising the algorithm. The results are then preferably stored in a computer accessible memory device in association with other selected information identifying each rated patent such that the corresponding rating may be readily referenced or retrieved for each patent in the sequential series.

Because the rating method in accordance with the modified embodiment of the invention described above directly calculates (for each patent or group of patents) the mathematical score or rating from the patent metrics themselves, there is no need to access related stored data, such as comparative representative patent data, from an associated database. Thus, the method can be carried out very rapidly for each patent in the sequential series. For example, using a high-speed computer executing a predetermined predictive algorithm the automated rating method described above can preferably be carried out in less than about 1–3 minutes per patent, more preferably in less than about 30–45 seconds per patent, and most preferably in less than about 5–10 seconds per patent. Moreover, because the predictive algorithm operates without requiring access to any comparative representative data, it may be easily stored, transferred, transported or otherwise communicated to others without the need to also store, transfer, transport or communicate the underlying comparative data used to develop the algorithm.

While it is preferred to provide independent B/D/R ratings and/or an overall score for each rated patent asset, those skilled in the art will recognize that numerous other ranking or rating systems may be used with efficacy in accordance with the teachings herein. For example, individual patent/claim scores may be ranked relative to a given population such that ratings may be provided on a percentile basis. Alternatively, numerical and/or alphanumerical scores may be assigned on a scale from 1–5, 1–9, 1–10, or A–E, for example. Optionally, and as illustrated in FIG. **11**, each claim of the reported patent may be analyzed and rated separately if desired. In that case, each claim (1–9 in the example illustrated in FIG. 11) is preferably indicated as being either independent ("I") or dependent ("D"), as the case may be. Alternatively, only the independent claims of a reported patent may be rated if desired.

Individual ratings **740**, **750** and **755** in report **700** preferably provide numerical ratings (1–10) of the likely breadth ("B"), defensibility ("D"), and relevance ("R") of each claim of the reported patent (and/or the patent as a whole). Such "BDR" ratings may alternatively be expressed in a variety of other suitable formats, such as letters, symbols, integer numerals, decimal numerals, percentage probabilities, percentile rankings, and the like. For example, a letter scoring system (e.g., A–E) could be assigned for each of the individual B/D/R components. In that case, a BDR rating of "B/A/A" would represent a "B" rating for breadth, and "A" ratings for both defensibility and relevance. An overall rating could then be derived from the individual BDR component ratings using a suitable conversion index rating system as generally illustrated below in Table 4:

TABLE 4

BDR Rating	Overall Rating
A/A/A	AAA
A/A/x	AA
A/x/A	AA
x/A/A	AA
A/x/x	A
x/A/x	A
x/x/A	A
B/B/B	BBB
B/B/x	BB
B/x/B	BB
x/B/B	BB
B/x/x	B
x/B/x	B
x/x/B	B
C/C/C	CCC
C/C/x	CC
C/x/C	CC
x/C/C	CC
C/x/x	C
x/C/x	C
x/x/C	C
x/x/x	D

In the above Table 4, "x" represents an individual component rating (either B, D or R) that is lower than the highest of the remaining rating component(s) such that only the highest component rating(s) are reflected in the overall rating. Thus, a BDR rating of A/A/B or A/B/A would each produce an overall rating of "AA." Likewise, a BDR rating of C/B/C or B/D/E would each produce an overall rating of "B." Optionally, various additional rules and/ or weighting formulas may be used to adjust the overall rating assigned in accordance with this system. For example, if one or more of the low component ratings "x" is two or more rating levels below the highest component rating(s) then the overall rating can be decreased by one increment. Thus, a BDR rating of C/B/C would produce an overall rating of "B" whilst a BDR rating of B/D/E would produce an overall rating of "CCC" or "CC". Preferably, if no individual component rating is at least a "C" (or other predetermined rating level) or higher, then the overall rating is assigned some arbitrary baseline rating, such as "D" or "C" or "S" and/or the like.

Preferably, estimated maintenance rates **760** are also provided and are indicated as percentage probabilities for each maintenance period. Alternatively, maintenance data may be provided in a number of other suitable formats, as desired, such as percentile kings, absolute or relative probabilities and the like. Also, various confidence levels may be calculated and displayed for each of the reported probabilities **760**, if desired.

Optionally, the report **700** may further include an estimated valuation range **770** or expected value of the reported

patent. Such patent valuation **770** may be based on a variety of suitable techniques that preferably take into account the rating information provided herein. For example, a modified cost-basis approach could be used whereby the cost-basis is multiplied by a suitable discount or enhancement factor corresponding to the rating(s) that the patent receives in accordance with the methods disclosed herein. In this manner, patents that receive higher-than-average ratings would be valued at more than their cost basis. Conversely, patents that receive lower-than-average ratings would be valued at less than their cost basis.

Similarly, a modified income valuation approach could be used whereby a hypothetical future projected income stream or average industry royalty rate is multiplied by a suitable discount or enhancement factor corresponding to the rating that the patent receives in accordance with the methods disclosed herein. In this manner, patents that receive higher ratings would be valued at higher than industry averages. Conversely, patents that receive lower ratings would be valued at lower than industry averages.

Another preferred approach would be to allocate patent value based on a percentile ranking of patents as determined herein. For this approach an approximated distribution of relative patent values is determined from existing patent renewal data, patent litigation data and/or the like. From this data, a value distribution curve can be constructed such as illustrated in FIG. **12**. The shape of the curve generally represents an estimated distribution (e.g., on a percentile basis) of approximated patent values spread over a range from the very highest-value patents to the very lowest-value patents. See also, Hall, "Innovation and Market Value," Working Paper 6984 NBER (1999) (suggesting an extremely skewed value distribution whereby a few patents are extremely valuable, while many others are worth little or almost nothing). The area under the curve **800** preferably corresponds to the total estimated value of all patents in a given patent population (e.g., all U.S. patents currently in force). This can be readily estimated or approximated by applying suitable macro-economic analysis. For example, it may be approximated as a percentage of total GNP, or as a percentage of total market capitalization of publicly traded companies, or as a multiple of annual budgeted PTO fees and costs, and/or the like.

Patents having the highest percentile rankings in accordance with the rating methods disclosed herein would then be correlated to the high end of the value distribution curve **800**. Conversely, patents having the lowest percentile rankings in accordance with the rating methods disclosed herein would then be correlated to the low end of the value distribution curve **800**. Advantageously, such allocative valuation approach brings an added level of discipline to the overall valuation process in that the sum of individual patent valuations for a given patent population cannot exceed the total aggregate estimated value of all such patents. In this manner, fair and informative valuations can be provided based on the relative quality of the patent asset in question without need for comparative market data of other patents or patent portfolios, and without need for a demonstrated (or hypothetical) income streams for the patent in question. Estimated valuations are based simply on the allocation of a corresponding portion of the overall patent value "pie" as represented by each patents' relative ranking or position along value distribution curve **800**.

Alternatively, any one or more of the above valuation techniques (or other techniques) can be combined or averaged to produce appropriate valuation ranges and/or various blended valuation estimates, as desired. Various confidence levels may also be calculated and reported for each of the reported value ranges **770**. Alternatively, several different value ranges can be calculated according to different desired confidence levels.

Internet Applications

The present invention is ideally suited for Internet-based applications. In one preferred embodiment, the invention would be made available to Internet users on the World Wide Web ("the web"), or a similar public network, and would be accessible through a web page. Various services, embodying different aspects of the present invention, could be made available to users on a subscription or a pay-per-use basis.

In an Internet-based application, users would preferably have access to automated patent ratings, consolidated patent ratings (i.e. grouped by technology, business sector, industry, etc.), and a host of ancillary information regarding particular patents or groups of patents. Ancillary information may include, for example, full-text searchable patent files, patent images, bibliographic data, ownership records, maintenance records, and the like. A user would preferably be able to enter or "click" on the number of a patent he or she was interested in and obtain, in very short order (e.g., in less than about 1–5 minutes), a comprehensive rating report as described above. Preferably, the user would be able to control most, if not all, of the variables in the rating calculation. Thus, for instance, he or she could request that the patent be rated only against other patents in the same art group, or in a specific industry, or in a particular field of use. He or she could request a report on how the patent compares to all patents that have been litigated in the past 5 years, or that have been held invalid by U.S. courts. In this manner, reports could be narrowly tailored to the specific interests and concerns of the user. This is beneficial—though not critical—because different types of users, e.g., lawyers, businessmen, manufacturers, investors, etc., will have slightly different appraisal needs.

In another preferred embodiment, it is not necessary that a user actually know the patent number or title of the patent he or she wishes to have rated. Instead, this preferred embodiment would include a series of correlation tables which allow the user to retrieve patent numbers based on ownership, field of use, or even specific commercial products. Thus, it would be possible for a user to request reports on all patents that have been issued or assigned to a particular company in the past 5 years.

Ideally, it would also be possible for a user to request reports on all patents associated with a specific commercial product. Such product patent information could advantageously be collected and stored on a centralized, searchable computer network database or the like in order to allow users to search and obtain patent information on particular commercial products. Relevant patent marking data could be gathered either through private voluntary reporting by manufacturers of such products and/or it may be gathered through other available means, such as automated web crawlers, third-party reporting or inputting and the like. Patent marking data (e.g., the presence or absence of a patent notice on a corresponding commercial product) and/or other relevant data (e.g., sales volume, sales growth, profits, etc.) could provide additional objective metric(s) by which to rate relevant patents in accordance with the invention. Presumably, patents that are being actively commercialized are more valuable than "paper patents" for which there is no corresponding commercial product. Optionally, the patent marking database can also include the necessary URL address information and/or the like which will allow users to

hot-link directly to a third-party web page for each corresponding product and/or associated product manufacturer.

In another embodiment of the invention, users would be allowed to request automatic updates and patent ratings according to certain user-defined parameters. Thus, a user who is particularly interested in the XYZ company could request an automatic updated report—sent to him substantially contemporaneously (preferably within a few days, more preferably within about 2–3 hours, and most preferably within less than about 5–10 minutes) via e-mail and/or facsimile—whenever the XYZ company obtains a newly issued patent. A similar updated report could be generated and sent any time a new patent issued or a new application is published in a particular technology field or class of interest. The updates would preferably contain a synopsis of each new patent or published application, as well as a patent rating performed according to that user's preferred criteria. Updated reports for each rated patent could also be generated periodically whenever one or more identified patent metrics changed (e.g., forward citation rate, change of ownership, litigation, etc.). Such automated updating of rating information would be particularly important to investment and financial analysts, who depend on rapid and reliable information to make minute-by-minute decisions. Updated report(s) could also be generated and published each week for all newly issued patents granted by the PTO for that current week. Thus, in accordance with one preferred embodiment of the invention, informative patent rating and/or ranking information may be provided within days or hours of a new patent being issued and published by the PTO.

Another service that may be provided in a preferred Internet-based application of this invention is a user-updated information database. According to this embodiment, certain users and/or all users would be allowed to post information they believe is pertinent to a particular patent or group of patents. Such information might include prior art that was not cited in the patent, possible license terms, potential problems with the written description or claims of the patent, information about the inventors, information relating to sales of patented products prior to the filing date, legal opinions, related litigation, and any other information that might be relevant to the patent. The information would preferably be stored and displayed in association with each particular patent to which it is relevant. Thus, from the user's perspective each patent would, in effect, have its own bulletin board or note pad associated with it, upon which users may post relevant information. Other information could also be displayed, such as license terms available, commercial product information, other patents of interest, electronic file wrappers, hot-links to other sites, and the like.

Optionally, submitters could also provide their own rating or ranking of the patent in question, such that patents could be essentially self-rated by users. In the preferred embodiment, only qualified users (or selected patent analysts) would be allowed to post such ratings. The qualification process could be as simple as filling out a questionnaire or as thorough as an independent verification of credentials. It is also possible to employ the methodology currently used by such web sites as "epinions.com" to track the popularity and veracity of individual user-submitted information and determine which users are most trusted. Those users that are most trusted would be brought to the top of the patent information database and their authors compensated according to the number of times users accessed the information, while less-popular submitters' information would sink in rank. Users and/or analysts could also be compensated financially (or otherwise) based on the accuracy of their ratings relative to the collective rating prediction and/or relative to the occurrence of a predicted future event. This would motivate more careful analysis and more accurate ratings. See, U.S. Pat. No. 5,608,620, incorporated herein by reference, for a description of a collective prediction and forecasting method using multiple individual forecasters, which may be readily adapted and applied to the present invention as disclosed herein.

The present invention is also well suited for incorporation into a newsletter service, such as the numerous financial newsletters currently available to Wall Street investors. In this embodiment of the invention, the rating system described herein would preferably be applied to a predefined subset of issued patents—for instance, all patents newly issued to "Fortune 500" companies or designated "Pre-IPO" companies. Overall patent ratings would be denoted with a standardized system, such as a 1–10 scale, four stars, bond-style ratings, "BDR" ratings and/or the like. Preferably, requested reports would be automatically generated and e-mailed to each subscriber on a periodic basis and/or on an event-triggered basis, as desired. In this way, subscribers would be provided with a standardized method of comparing patent portfolios of various companies from week to week.

While the statistical rating method and system of the present invention is disclosed and discussed specifically in the context of rating utility patents, those skilled in the art will readily appreciate that the techniques and concepts disclosed herein may have equal applicability to rating other types of intellectual property assets, such as trademarks, copyrights, trade secrets, domain names, web sites and the like. Moreover, although this invention has been disclosed in the context of certain preferred embodiments and examples, it will be under-stood by those skilled in the art that the present invention extends beyond the specifically disclosed embodiments to other alternative embodiments and/or uses of the invention and obvious modifications and equivalents thereof. Thus, it is intended that the scope of the present invention herein disclosed should not be limited by the particular disclosed embodiments described above, but should be determined only by a fair reading of the claims that follow.

What is claimed is:

1. A computer-automated method for rating or ranking patents or other intangible assets comprising:

selecting a first population of patents having a first quality or characteristic;

selecting a second population of patents having a second quality or characteristic that is different from or assumed to be different from said first quality or characteristic;

providing a computer-accessible database of selected patent metrics representative of or describing particular corresponding characteristics of each said patents in said first and second patent populations;

constructing a computer regression model based on said selected patent metrics, said regression model being operable to input said selected patent metrics for each said patent in said first and second patent populations and to output a corresponding rating or ranking that is generally predictive of the presence or absence of said first and/or second quality in said first and second patent populations according to a determined statistical accuracy; and

using said regression model to rate or rank one or more patents in a third patent population by inputting into

said regression model selected patent metrics representative of or describing corresponding characteristics of said one or more patents in said third population to be rated or ranked and causing said regression model to output a corresponding rating or ranking based thereon.

2. The method of claim 1 wherein said first population of patents have the quality or characteristic of being the subject of prior litigation and wherein said second population of patents have the quality or characteristic of not having been the subject of prior litigation.

3. The method of claim 1 wherein said first population of patents have the quality or characteristic of being successfully litigated and wherein said second population of patents have the quality or characteristic of being unsuccessfully litigated.

4. The method of claim 1 wherein said first population of patents have the quality or characteristic of being found infringed in prior litigation and wherein said second population of patents comprises a random sample of patents from the general patent population of issued patents.

5. The method of claim 1 wherein said first population of patents have the quality or characteristic of being maintained in force for more than a predetermined period of years and wherein said second population of patents have the quality or characteristic of being abandoned within said predetermined period of years.

6. The method of claim 1 wherein said first and second patent populations have roughly the same population size.

7. The method of claim 6 wherein said first and second patent populations have a population size of greater than about 1000 patents.

8. The method of claim 7 wherein said first or second patent populations have a population size of between about 20,000 and 80,000 patents.

9. The method of claim 1 wherein said third population of patents is the same as and/or overlaps either said first or second populations of patents.

10. The method of claim 1 wherein said third population of patents comprises essentially all newly issued patents as periodically published by the PTO.

11. The method of claim 1 wherein said third population of patents is selected from the group consisting of either: an individual selected patent, a group of commonly owned patents, a portfolio of patents controlled by one or more public corporations, a portfolio of patents controlled by one or more pre-IPO companies, all patents listing one or more particular named inventors, all patents naming one or more particular prosecuting attorneys or law firms, all patents classified within one or more PTO patent classifications, or all patents issued between a first date and a second date.

12. The method of claim 1 wherein said selected patent metrics comprise one or more characteristics of each said patents in said first and second patent populations that are determined or assumed to have either a positive or negative correlation with the presence or absence of said first or second quality to a statistically significant degree.

13. The method of claim 12 wherein said selected patent metrics include one or more of the following: number of claims per patent, number of words per claim, different words per claim, length of patent specification, number of drawing pages or figures, number of cited prior art references, age of cited references, number of subsequent citations received, subject matter classification and subclassification, origin of the patent, payment of maintenance fees, name of prosecuting attorney or law firm, examination art group, or length of pendency in the PTO.

14. The method of claim 12 wherein at least one of said patent metrics include one or more of the following: patent marking data, claim relatedness, patent relatedness, or claim type.

15. The method of claim 12 wherein at least one of said patent metrics comprises a modified claim word-count metric whereby each word and/or word phrase in a patent claim of interest is assigned a certain point value generally proportional to its determined frequency of use in a relevant patent population and wherein the word-count metric is set equal to the sum of each of the individual word point values for essentially all of the words or word phrases contained within said claim.

16. The method of claim 12 wherein at least one of said selected patent metrics comprises a relatedness metric generally indicative of the commonality of word or word phrase usage between one or more patent claims and/or patent specifications.

17. The method of claim 1 wherein said regression model comprises a multiple regression model that correlates multiple individual predictor variables comprising said selected patent metrics to a single desired criterion variable comprising the desired output rating or ranking.

18. The method of claim 17 wherein said multiple regression model has the form:

$$CV_m = f\{PV_1, PV_2 \ldots PV_n\}$$

where:

CV_m=criterion variable or quality/event desired to be predicted

PV_n=predictor variables or selected patent metrics.

19. The method of claim 18 wherein said regression model includes no more than about 10 to 30 predictor variables.

20. The method of claim 19 wherein said regression model includes between about 15 and 25 predictor variables.

21. The method of claim 1 wherein said rating or ranking is generally predictive of the probability of the patents in the third population being found either valid or invalid, being found either infringed or not infringed, or being maintained in force beyond a predetermined time period.

22. The method of claim 1 comprising the further step of determining the statistical accuracy of the regression model in accordance with the general formula:

$$SA(m) = CO/(CO+IN)$$

where:

SA(m)=statistical accuracy of regression model (m)

CO=number of correct predictions for model (m)

IN=number of incorrect predictions for model (m).

23. The method of claim 22 comprising the further steps of:

incrementally modifying the regression model (m) to produce a modified regression model (m+1);

determining the statistical accuracy of the modified regression model (m+1);

comparing the statistical accuracy of the modified regression model (m+1) to the previously determined statistical accuracy of regression model (m); and

either repeating said incremental modification of the regression model (m+1) to produce a further modified regression model (m+2) if the determined statistical accuracy of the modified regression model (m+1) is greater than the determined statistical accuracy of the regression model (m), or reversing said incremental modification of regression model (m+1) to produce the original regression model (m) if the determined statistical accuracy of the modified regression model (m+1)

is less than the determined statistical accuracy of the regression model (m).

24. The method of claim 1 comprising the further step of generating a patent rating report for an individual selected patent or selected group of patents contained in said third population of patents, said report including basic information identifying said selected patent or selected group of patents and one or more of said ratings or rankings determined therefor.

25. The method of claim 24 wherein said patent rating report is generated in response to an electronic request transmitted over a computer network and wherein said report is generated and displayed automatically without further human intervention.

26. The method of claim 24 comprising the further step of, after generating said report, automatically without further human intervention transmitting said report electronically over a computer network to one or more intended recipients.

27. The method of claim 24 wherein said patent rating report contains at least one reported rating or ranking that is generally representative of the breadth ("B") or likely infringement of the selected patent or group of patents, at least one reported rating or ranking that is generally representative of the defensibility ("D") or likely validity of the selected patent or group of patents, and at least one reported rating or ranking that is generally representative of the commercial relevance ("R") or technical merit of the selected patent or group of patents.

28. The method of claim 27 wherein said B and D ratings or rankings are calculated by one or more computer regression models constructed and adjusted to be predictive of known litigation outcomes of selected first and second populations of litigated patents based on said selected patent metrics, and wherein said R rating or ranking is generated by a computer regression model constructed and adjusted to be generally predictive of known patent maintenance or mortality rates of selected first and second populations of maintained or abandoned patents based on said selected patent metrics.

29. A patent rating report generated according to the method of claim 24.

30. A patent rating report generated in accordance with the method of claim 24 and wherein said report contains an organized list of said patent ratings or rankings for substantially every issued patent within a predefined patent population.

31. A patent rating report generated in accordance with the method of claim 30, and including the further step of determining and reporting the statistical accuracy of substantially each said patent rating or ranking contained in said report.

32. The method of claim 1 comprising the further steps of:

providing data representative of a patent value distribution curve, the shape of the curve generally representing an estimated distribution of patent value according to relative ratings or rankings within said third patent population and wherein the area under the curve is generally proportional to the total estimated value of all patents in said third patent population; and

using said representative data to estimate a value or value range for an individual selected patent from said third patent population according to its relative rating or ranking within said third patent population.

33. A high-speed method for automatically scoring or rating a predefined population of selected patents in a sequential series of newly issued patents published periodically by the PTO and for determining and storing certain rating or scoring information specific to each said selected patent in said sequential series, said method comprising:

obtaining a substantial full-text copy of the specification and claims of each said selected patent in the sequential series in a computer text file format or other computer-accessible format;

using a computer program to automatically access and read each said computer text file and to extract therefrom certain selected patent metrics representative of or describing particular corresponding characteristics of each said selected patent in the sequential series;

inputting said extracted patent metrics into a computer regression algorithm, said algorithm being selected and adjusted to produce in response to said patent metrics a corresponding rating output or mathematical score that is generally predictive of a particular patent quality of interest and/or the probability of a particular future event occurring; and

for each said selected patent in the sequential series storing the resulting algorithm output in a computer accessible storage device in association with other selected information identifying said selected patent.

34. The method of claim 33 wherein said predefined population of patents comprises one or more of the following: a group of commonly owned patents, a portfolio of patents controlled by one or more public corporations, a portfolio of patents controlled by one or more pre-IPO companies, all patents listing one or more particular named inventors, all patents naming one or more particular prosecuting attorneys or law firms, all patents classified within one or more PTO patent classifications, or all patents issued between a first date and a second date.

35. The method of claim 33 wherein said extracted patent metrics comprise one or more characteristics of each said patents in said predefined population of patents that are determined or assumed to have either a positive or negative correlation with the presence or absence of the particular quality of interest and/or the probability of a particular future event occurring relative to each said patent in the predetermined patent population.

36. The method of claim 35 wherein said extracted patent metrics include one or more of the following: number of claims per patent, number of words per claim, different words per claim, length of patent specification, number of drawing pages or figures, number of cited prior art references, age of cited references, number of subsequent citations received, subject matter classification and subclassification, origin of the patent, payment of maintenance fees, name of prosecuting attorney or law firm, examination art group, or length of pendency in the PTO.

37. The method of claim 35 wherein at least one of said extracted patent metrics include one or more of the following: patent marking data, claim relatedness, patent relatedness, or claim type.

38. The method of claim 35 wherein at least one of said extracted patent metrics comprises a modified claim word-count metric whereby each word and/or word phrase in a patent claim of interest is assigned a certain point value generally proportional to its determined frequency of use in a relevant patent population and wherein the word-count metric is set equal to the sum of each of the individual word point values for essentially all of the words or word phrases contained within said claim.

39. The method of claim 35 wherein at least one of said selected patent metrics comprises a relatedness metric generally indicative of the commonality of word or word phrase usage between one or more patent claims and/or patent specifications.

40. The method of claim 33 wherein said regression model comprises a multiple regression model that correlates multiple individual predictor variables comprising said extracted patent metrics to a single desired criterion variable comprising the algorithm output.

41. The method of claim 40 wherein said multiple regression model has the form:

$$CV_m = f\{PV_1, PV_2 \ldots PV_n\}$$

where:

CV_m=criterion variable or quality/event desired to be predicted

PV_n=predictor variables or selected patent metrics.

42. The method of claim 41 wherein said regression model includes no more than about 10 to 30 predictor variables.

43. The method of claim 42 wherein said regression model includes between about 15 and 25 predictor variables.

44. The method of claim 33 comprising the further step of determining the statistical accuracy of the regression model in accordance with the general formula:

$$SA(m) = CO/(CO+IN)$$

where:

SA(m)=statistical accuracy of regression model (m)

CO=number of correct predictions for model (m)

IN=number of incorrect predictions for model (m).

45. The method of claim 33 comprising the further step of generating a patent rating report for each said selected patent contained within said predefined population of patents, said report including basic information identifying each said selected patent and the corresponding algorithm output determined therefor.

46. A patent rating report generated according to the method of claim 45.

47. A patent rating report generated in accordance with the method of claim 45 and including the further step of determining and reporting in said rating report the statistical accuracy of said algorithm output.

48. The method of claim 33 comprising the further steps of:

providing data representative of a patent value distribution curve, the shape of the curve generally representing an estimated distribution of patent value according to relative ratings or rankings within said predefined patent population and wherein the area under the curve is generally proportional to the total estimated value of all patents in said predefined patent population; and

using said representative data to estimate a value or value range for an individual selected patent from said predefined patent population according to its relative rating or ranking within said predefined patent population.

49. An automated method for determining an estimated rating or ranking of an intellectual property asset to be rated, comprising:

storing first objectively determinable characteristics of representative intellectual property assets and at least one objectively determinable quality corresponding to each of the representative intellectual property assets;

constructing a computer regression model based on the first objectively determinable characteristics and the at least one objectively determinable quality corresponding to each of the representative intellectual property assets, said regression model being selected and adjusted to input said first objectively determinable characteristics corresponding to each of the representative intellectual property assets and to output in each case a corresponding mathematical rating or ranking that is generally predictive, according to a determined statistical accuracy, of said at least one objectively determinable quality corresponding to each of the representative intellectual property assets;

analyzing the intellectual property asset to be rated to determine second objectively determinable characteristics of the intellectual property asset to be rated; and

using said regression model to rate or rank said intellectual property asset to be rated by inputting said second objectively determinable characteristics into said regression model and causing said regression model to output a corresponding estimated rating or ranking.

50. The method of claim 49 wherein said representative intellectual property assets comprise patents that have been the subject of prior litigation through final judgement and wherein said at least one objectively determinable quality comprises one or more of the following: a final judgement of infringement, a final judgement of non-infringement, a final judgement of invalidity, a final judgement of non-invalidity, a final judgement in favor of the patentee, a final judgement in favor of the accused.

51. The method of claim 49 wherein said representative intellectual property assets comprise patents maintained in force for more than a predetermined period of years.

52. The method of claim 49 wherein said intellectual property to be rated comprises one or more of the following: an individual selected patent, a group of commonly owned patents, a portfolio of patents controlled by one or more public corporations, a portfolio of patents controlled by one or more pre-IPO companies, all patents listing one or more particular named inventors, all patents naming one or more particular prosecuting attorneys or law firms, all patents classified within one or more PTO patent classifications, or all patents issued between a first date and a second date.

53. The method of claim 49 wherein said first and second objectively determinable characteristics comprise one or more characteristics of said representative intellectual property assets that are determined or assumed to have either a positive or negative correlation with the presence or absence of said objectively determinable quality.

54. The method of claim 49 wherein said intellectual property asset to be rated comprises one or more patents and wherein first and second objectively determinable characteristics comprise one or more of the following: number of claims per patent, number of words per claim, different words per claim, length of patent specification, number of drawing pages or figures, number of cited prior art references, age of cited references, number of subsequent citations received, subject matter classification and sub-classification, origin of the patent, payment of maintenance fees, name of prosecuting attorney or law firm, examination art group, or length of pendency in the PTO.

55. The method of claim 54 wherein at least one of said first and second objectively determinable characteristics include one or more of the following: patent marking data, claim relatedness, patent relatedness, or claim type.

56. The method of claim 54 wherein at least one of said first and second objectively determinable characteristics comprises a modified claim word-count metric whereby each word and/or word phrase in a patent claim of interest is assigned a certain point value generally proportional to its determined frequency of use in a relevant patent population and wherein the word-count metric is set equal to the sum of

each of the individual word point values for essentially all of the words or word phrases contained within said claim.

57. The method of claim **54** wherein at least one of said first and second objectively determinable characteristics comprises a relatedness metric generally indicative of the commonality of word or word phrase usage between one or more patent claims and/or patent specifications.

58. The method of claim **49** wherein said regression model comprises a multiple regression model that correlates multiple individual predictor variables comprising said first and second objectively determinable characteristics to a single desired criterion variable comprising said objectively determinable quality.

59. The method of claim **58** wherein said multiple regression model has the form:

$$CV_m = f\{PV_1, PV_2 \ldots PV_n\}$$

where:

CV_m=criterion variable or quality/event desired to be predicted

PV_n=predictor variables or selected patent metrics.

60. The method of claim **59** wherein said regression model includes between about 15 and 25 predictor variables.

61. The method of claim **49** wherein said rating or ranking is generally predictive according to a determined statistical accuracy of the probability of a future event affecting said intellectual property asset to be rated.

62. The method of claim **61** comprising the further step of determining the statistical accuracy of the regression model in accordance with the general formula:

$$SA(m) = CO/(CO+IN)$$

where:

SA(m)=statistical accuracy of regression model (m)

CO=number of correct predictions for model (m)

IN=number of incorrect predictions for model (m).

63. The method of claim **62** comprising the further steps of:

incrementally modifying the regression model (m) to produce a modified regression model (m+1);

determining the statistical accuracy of the modified regression model (m+1);

comparing the statistical accuracy of the modified regression model (m+1) to the previously determined statistical accuracy of regression model (m); and

either repeating said incremental modification of the regression model (m+1) to produce a further modified regression model (m+2) if the determined statistical accuracy of the modified regression model (m+1) is greater than the determined statistical accuracy of the regression model (m), or reversing said incremental modification of regression model (m+1) to produce the original regression model (m) if the determined statistical accuracy of the modified regression model (m+1) is less than the determined statistical accuracy of the regression model (m).

64. The method of claim **49** comprising the further step of generating a rating report containing at least one reported rating or ranking that is generally representative of the breadth ("B") of the intellectual property asset to be rated, at least one reported rating or ranking that is generally representative of the defensibility ("D") of the intellectual property asset to be rated, and at least one reported rating or ranking that is generally representative of the commercial relevance ("R") of the intellectual property asset to be rated.

65. A rating report generated according to the method of claim **64**.

66. The method of claim **49** comprising the further steps of:

providing data representative of an intellectual property asset value distribution curve, the shape of the curve generally representing an estimated distribution of patent value according to relative ratings or rankings of said representative intellectual property assets and wherein the area under the curve is generally proportional to the total estimated value of all representative intellectual property assets; and

using said representative data to estimate a value or value range for said intellectual property asset to be rated according to its relative rating or ranking among said representative intellectual property assets.

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